NOVEMBER 9, 1961

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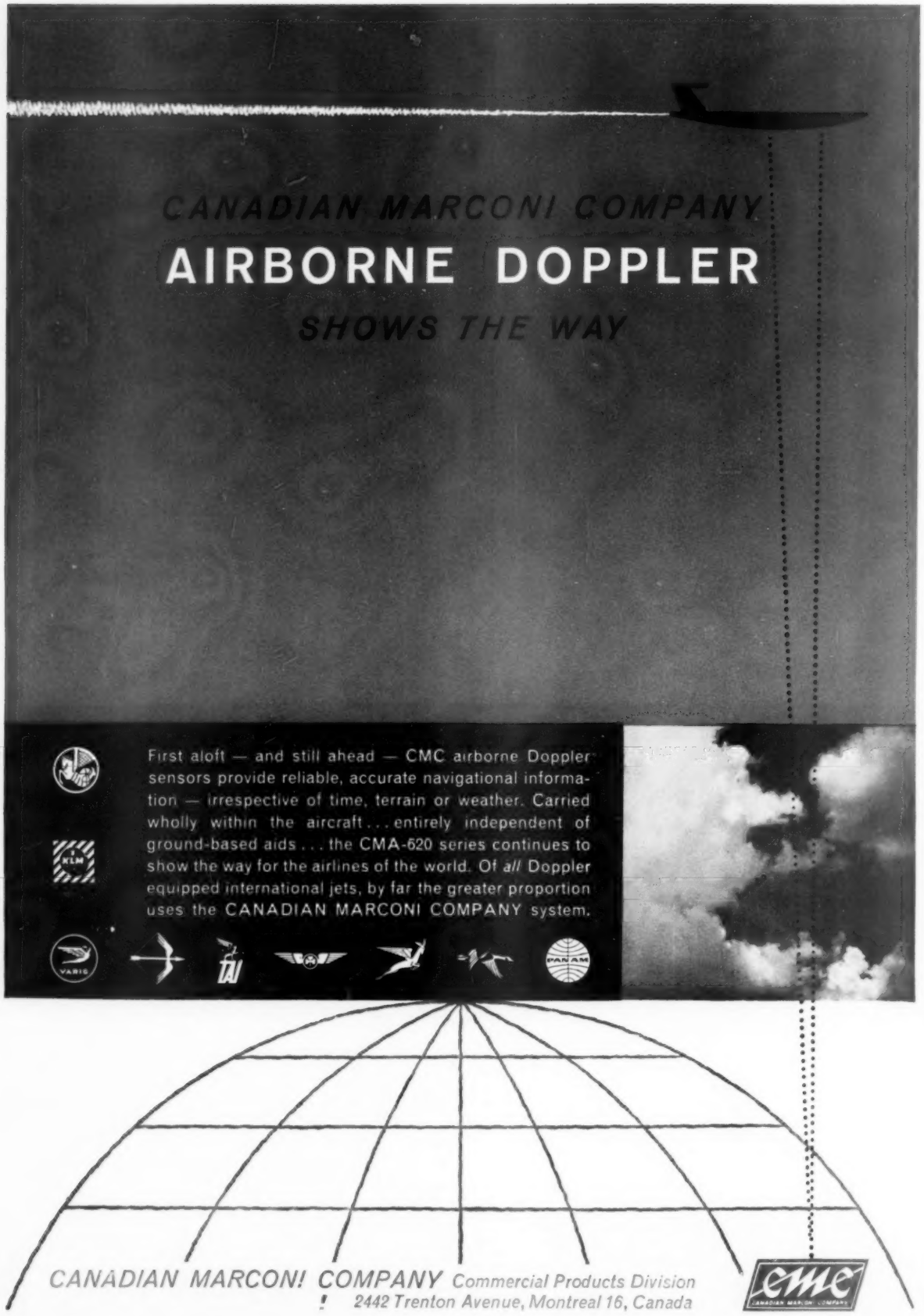
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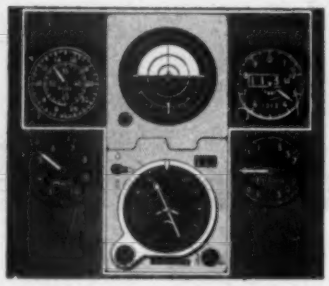
In the automatic control and the fully automatic landing of aircraft, SMITHS lead the world. SMITHS Flight Control System is the only system in the world designed as a single entity to provide full automatic control through every phase of flight, including the landing manoeuvre. SMITHS Flight Control System, including Multiplex autopilot, is specified for the de Havilland Trident when it enters service for BEA. In matters of flight control and instrumentation the *automatic* choice is SMITHS.

The main pilot's basic instrument display of the flight control systems reflects the layout of the central controller, thereby introducing a natural relationship between the two. The presentation shown here has been designed for the D.H. Trident *and illustrates the clear and positive displays achieved.*



Here is a brief factual report of SMITHS achievements in this field up to the beginning of this year:

SMITHS have been making automatic pilots since 1933.

SMITHS designed and made the first British electrically operated automatic pilot.

SMITHS designed and made the automatic pilot used in the world's first turbo-jet and turbo-prop airliners.

SMITHS automatic pilot (and associated equipment) is the heart of the world's first *fully automatic landing equipment* to go into production. This is the 'Autoland' system, in the design of which SMITHS collaborated closely with the Blind Landing Experimental Unit of the Royal Aircraft Establishment. The 'Autoland' system has been adopted by the Royal Air Force.

SMITHS automatic landing equipment has, in the last ten years, carried out more successful automatic landings than *all* other known systems in the world added together.

SMITHS embarked five years ago on a new generation of automatic pilots, designed to increase the safety factor to a level that will meet the stringent safety requirements that the civil air lines need for automatic landing.

SMITHS latest-generation automatic pilots will be the heart of the automatic system to be fitted in the de Havilland 'Trident' (under construction for BEA) and the Short 'Belfast' heavy freighter (on order for RAF Transport Command). Negotiations are in progress with other operators.

SMITHS automatic landing equipment has been ordered by the USA Federal Aviation Agency for evaluation tests in America.

SMITHS AVIATION DIVISION

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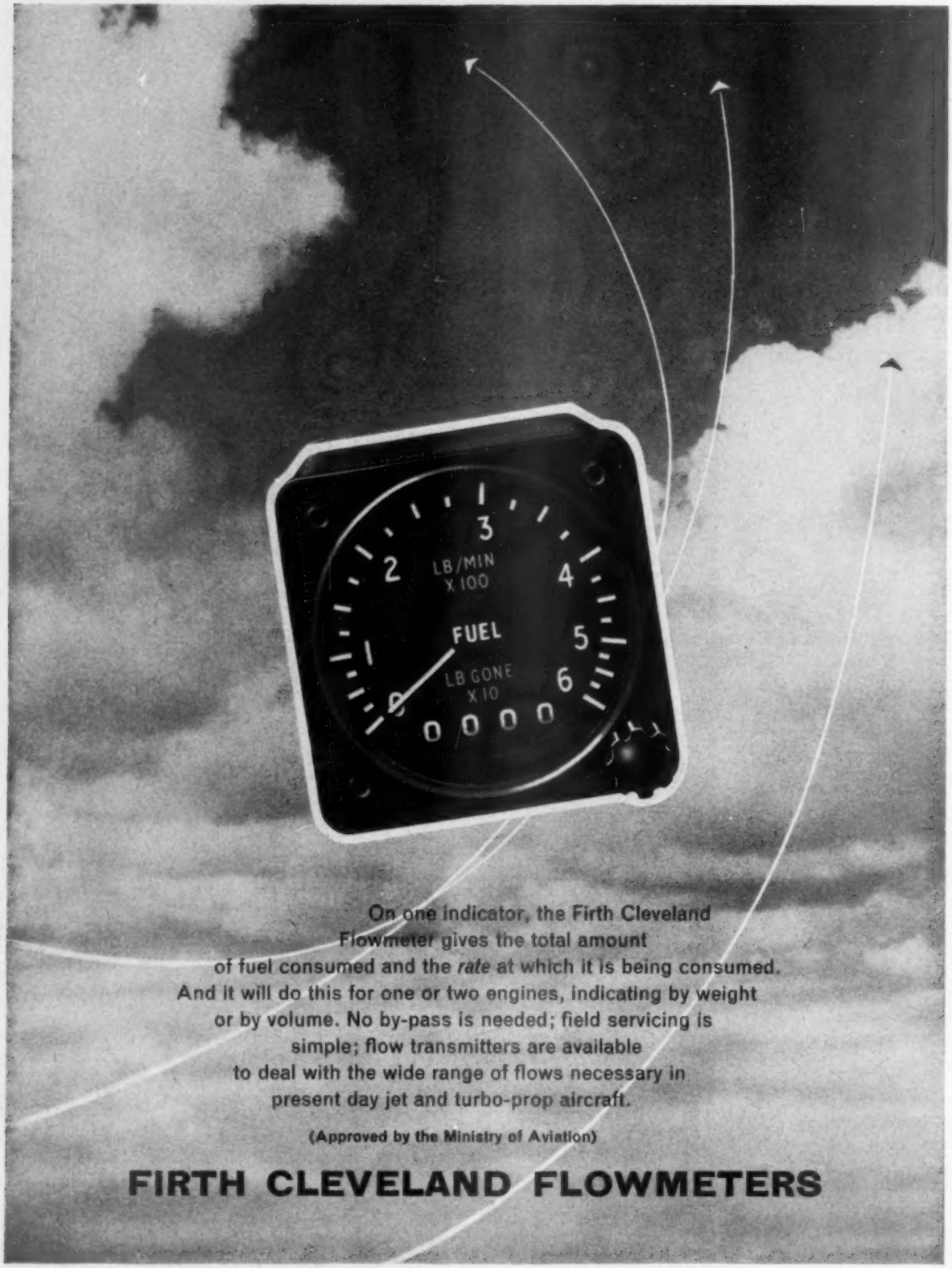
approach... *automatically*



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THE FAST EXPANDING AFRICAN AIRLINE

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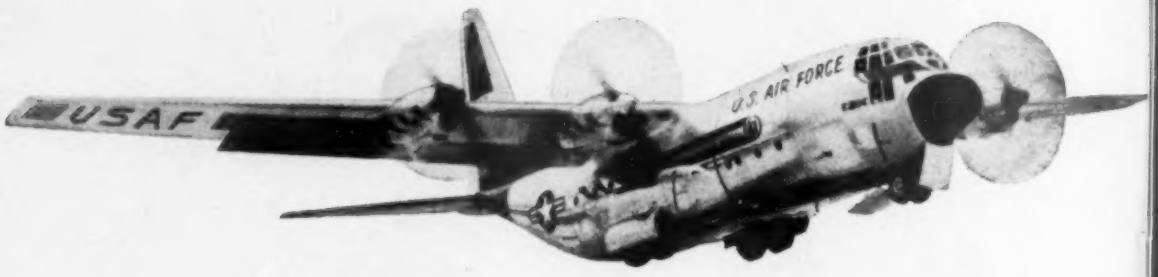
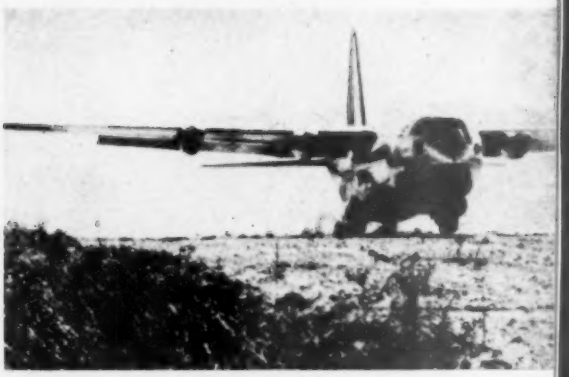


FOUR

PARADROPS BIG EQUIPMENT



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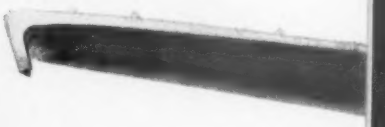

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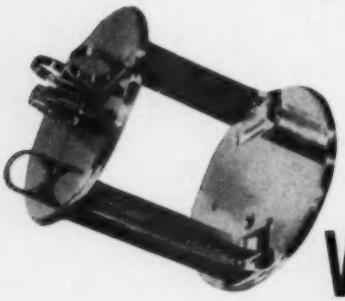
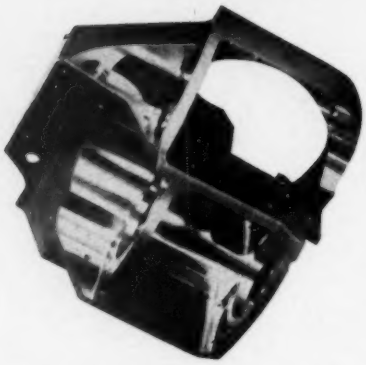


When the pace is hotting up—



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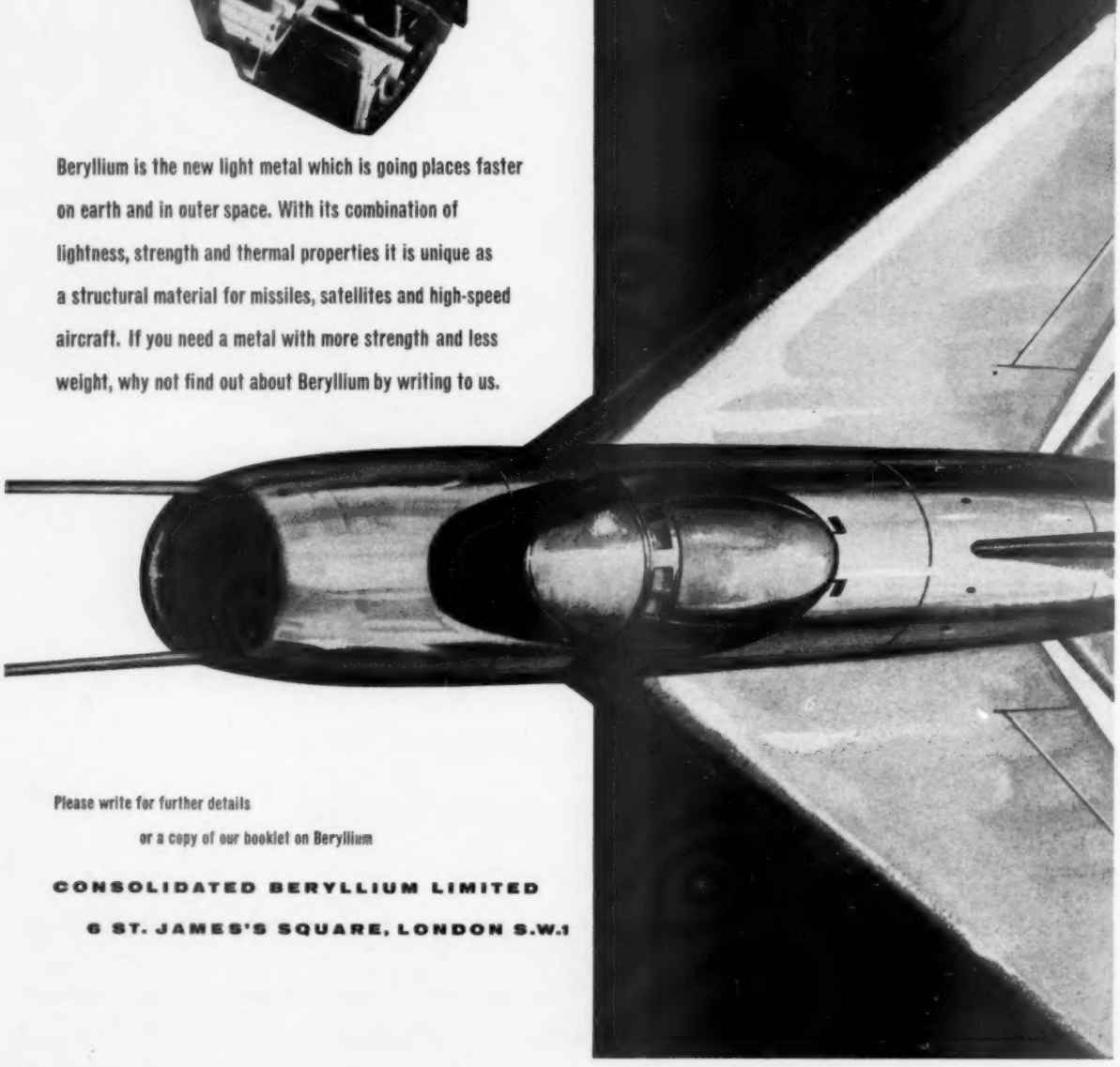

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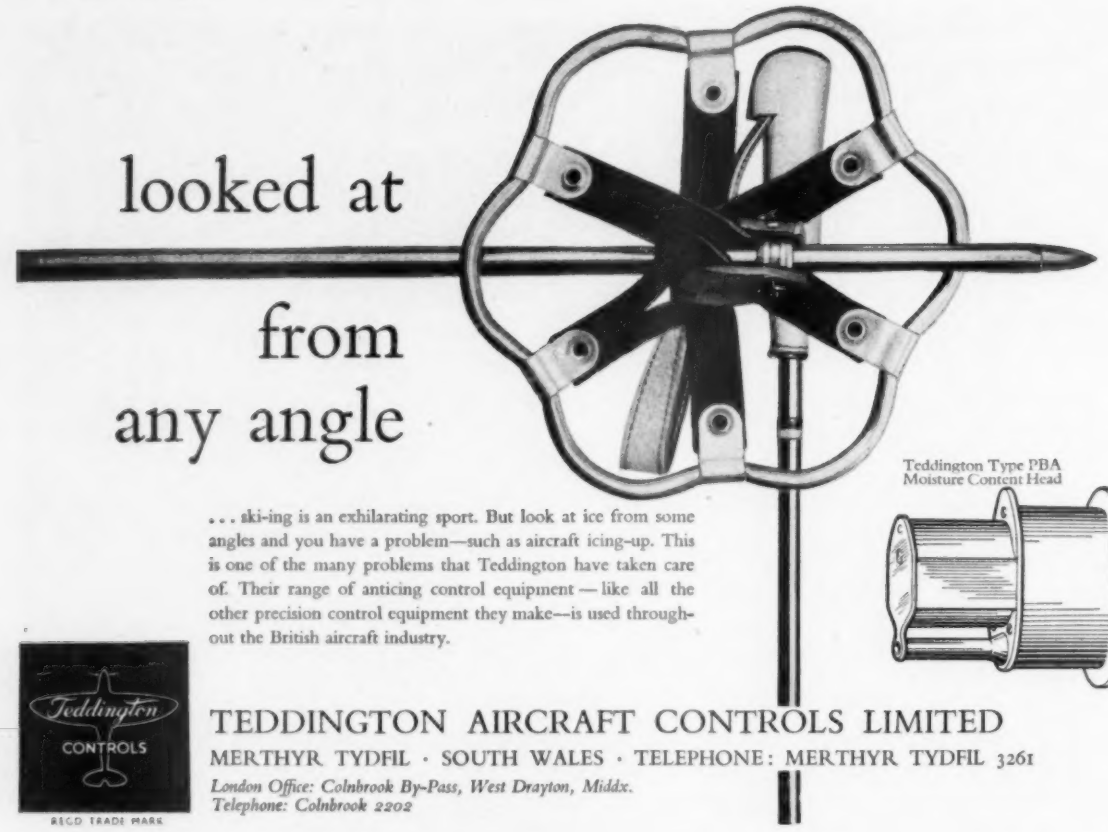

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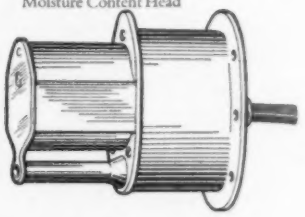

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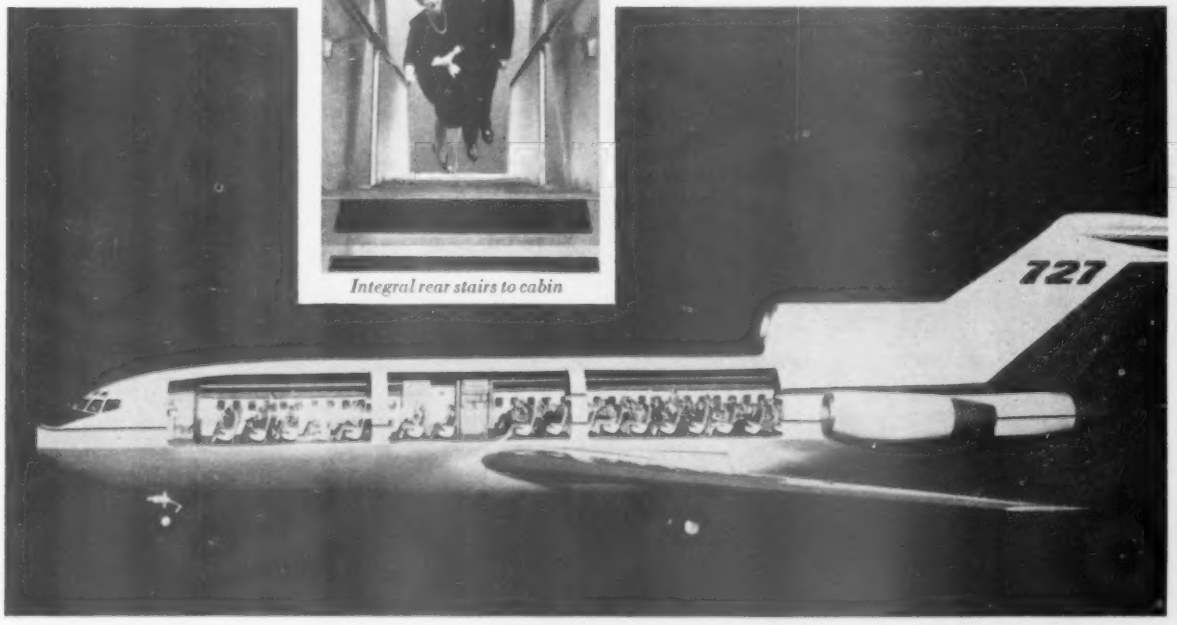
Preview of the new short-range Boeing 727

727 has 3 rear-mounted engines

Mock-up of 1st class cabin section

Integral rear stairs to cabin

Wide 727 cabin permits 6-abreast high density seating



Shown above are photos of scale models and a full-size mock-up illustrating some of the outstanding features of the new Boeing 727 short-range jetliner.

Designed to produce an operating profit even at modest load factors, the 727 is a high-performance jet that will service 150- to 1700-mile routes, operating from 5000 foot runways with full payload.

The 727 brings airlines many short-route features, including quick takeoff, rapid climb to cruise altitude, low approach speed, the durability required for frequent takeoffs and landings, and integral airborne stairs to help reduce ground time during short stops. Capacity ranges from 70 first-class to 113 tourist-class passengers, plus 850 cubic feet of heated and pressurized cargo space. Another unique 727 advantage is the incorporation of many systems and components proved out in more than 350,000,000 miles of Boeing jetliner operations.

Already, American Airlines, Eastern Air Lines, Lufthansa German Airlines and United Air Lines have ordered 117 Boeing 727s for delivery beginning late in 1963.

BOEING 727

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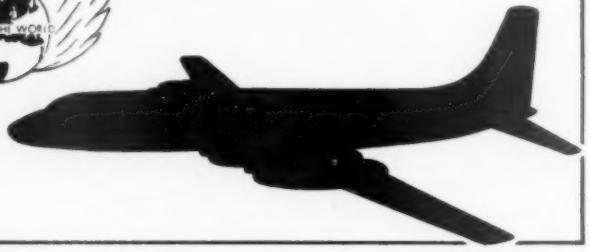

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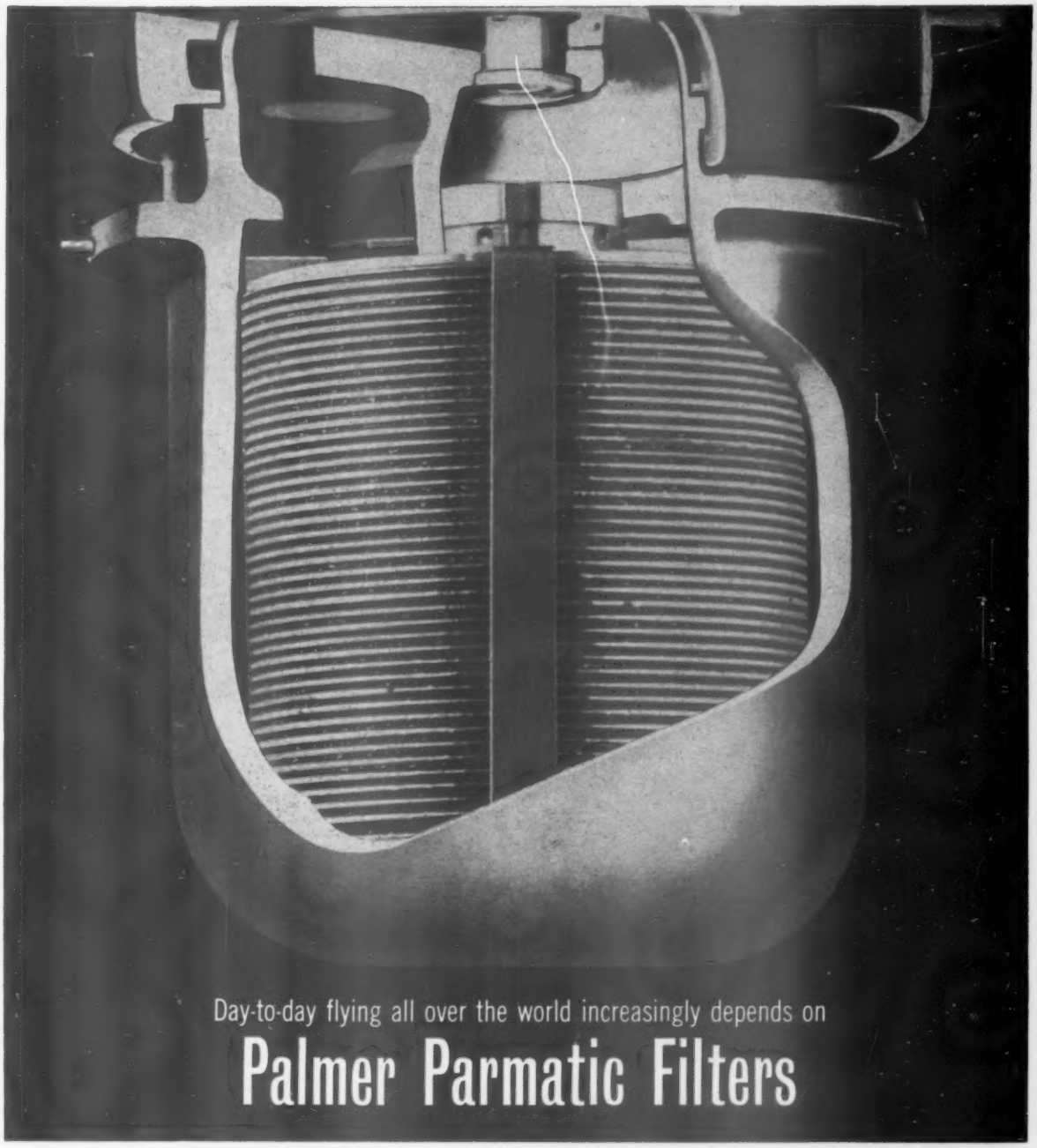

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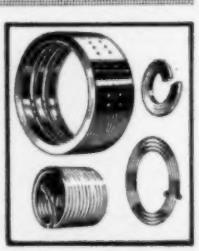

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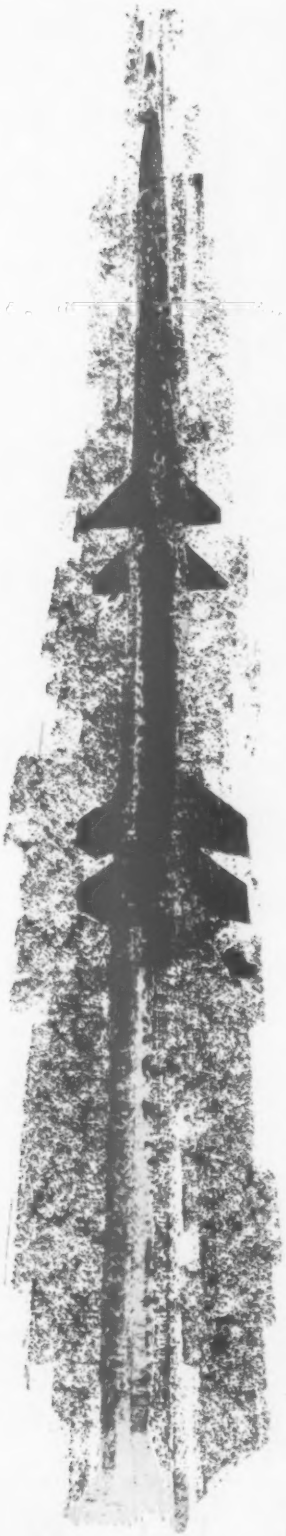

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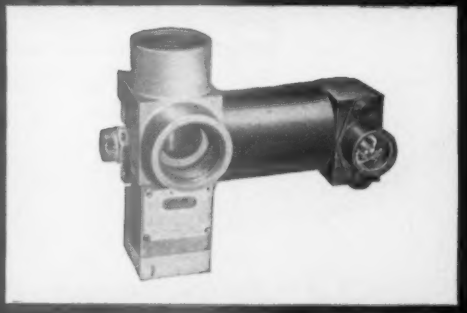

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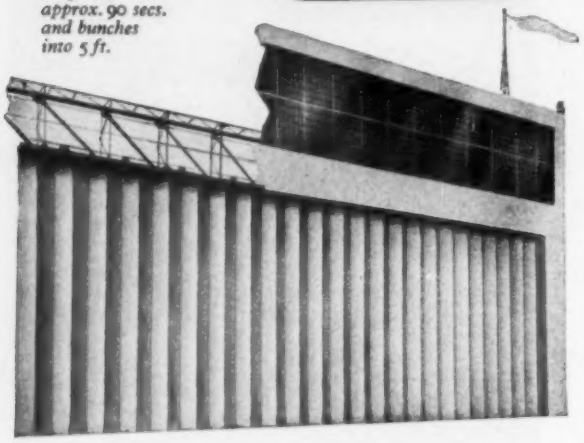

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Below : A pair of electrically operated traffic booms.

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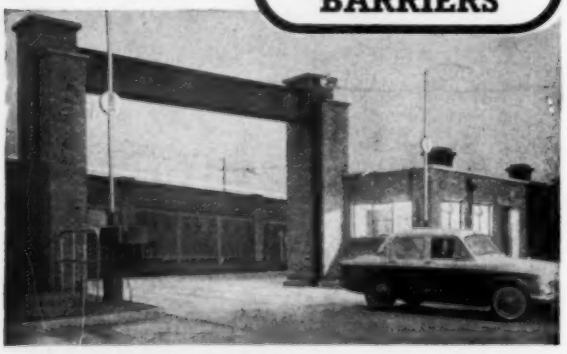

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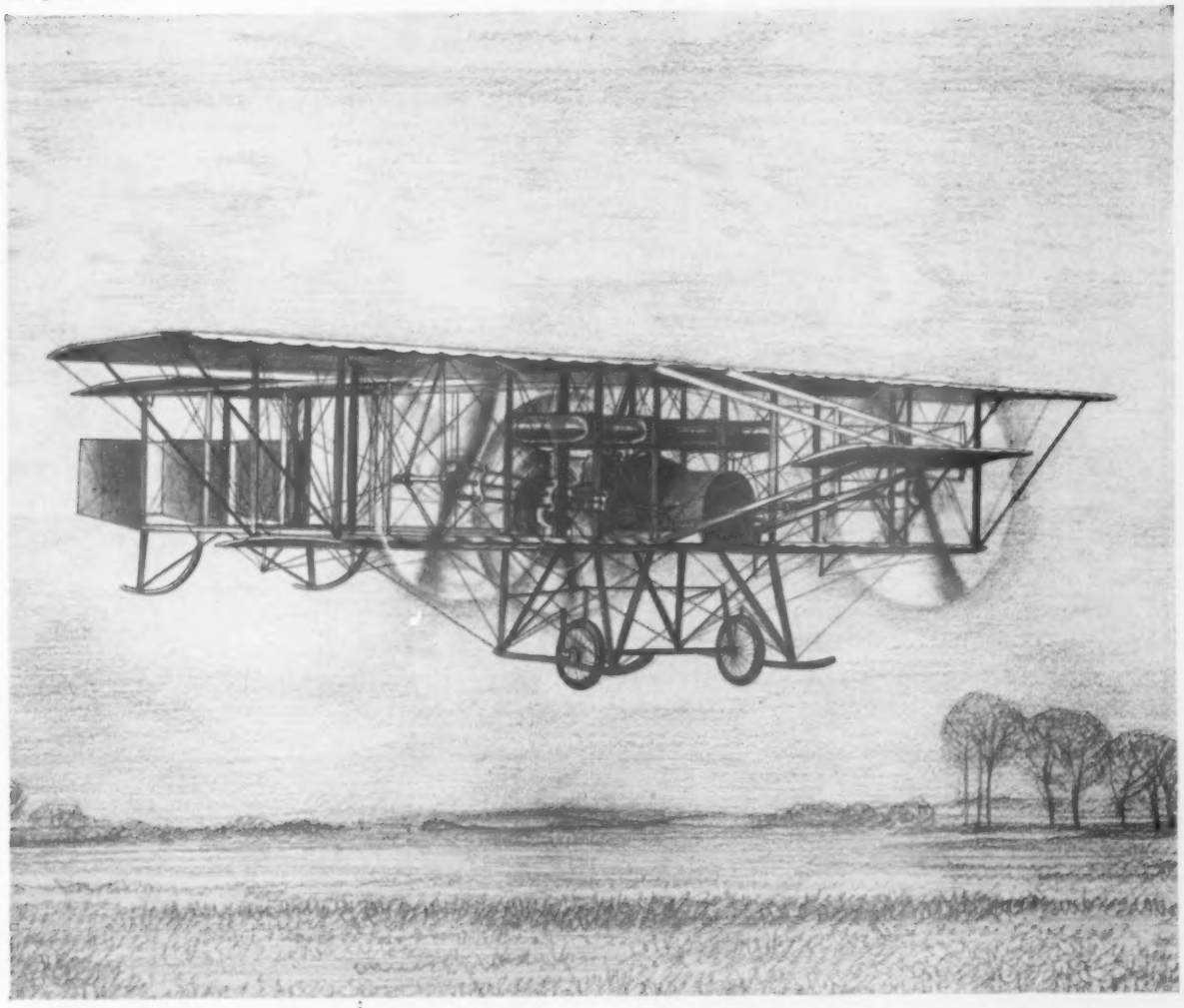

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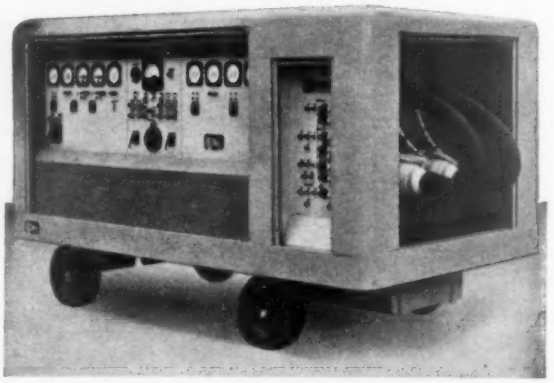

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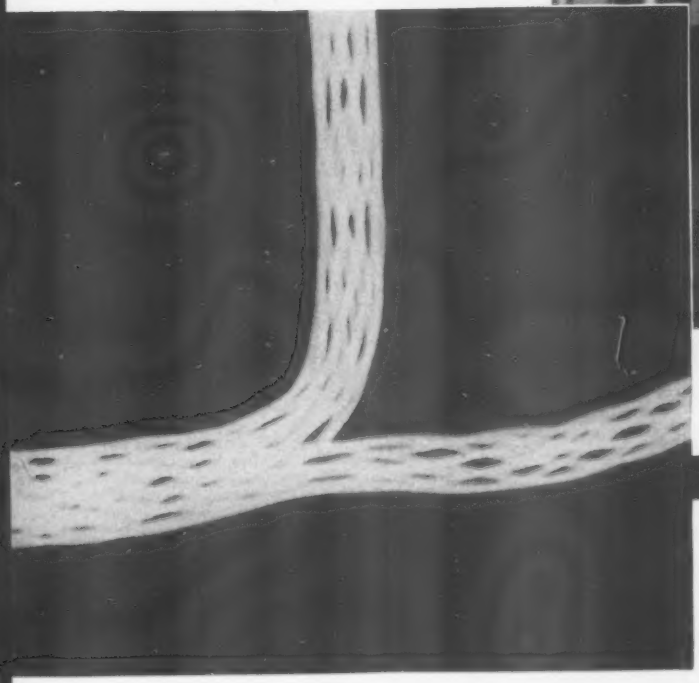

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THE AEROPLANE and ASTRONAUTICS

VOLUME 101 NUMBER 2612 NOVEMBER 9, 1961

Commercial Aviation and the Future

This is the latest issue of the Airlines of the World annual number which we have been publishing regularly since 1948. Nobody is going to pretend that the year covered in our review has been a happy one for the operators. Some of the reasons for this situation are discussed in the introduction to the supplement.

A coincidence of some aptness is the publication this week of the Sixth Henry Royce Memorial Lecture by Peter G. Masefield in which the author makes an appraisal of the next 10 years of commercial aviation. We have therefore been able to include in this issue a number of extracts from the paper emphasizing the problems which yet remain to be solved (p. 622).

In the introduction to his paper Mr. Masefield has touched on certain wider aspects of his subject. In particular, we have changed, says the author, in this era of the "Scientific Sixties" from a "classical" to a "scientific" economy. The change has been so gradual that many in the seats of authority have not yet grasped the fact.

Today we are living in an era which calls for approaches to national administration and the national economy which differ from those which have been serving since the industrial revolution. All politicians and all Government officials, in Mr. Masefield's view, have to recognize that the old hit-and-miss methods are no longer adequate for any aspect of national life, in this age of the computer and electronic brain. In the same line of reasoning he asserts the use of the electronic computer is a closed book to 99% of those who direct our national life today. Yet it—and still more what it represents—is essential to the strategic scientific concept of our future.

Next week we hope to discuss the shining future which Mr. Masefield foresees for General Aviation, the more youthful of the two partners which make up Commercial Aviation. In Mr. Masefield's view it has an exciting and profitable future. We agree.

The Disaster of No Orders

Turning from Mr. Masefield's ably argued case for a planned future or at least strategically controlled development in the scientific and technological areas of national endeavour, attention must be given to statements made by two men who carry the very heavy responsibility of directing effort in our two aircraft groups. Both were speaking at the Boscombe Down Dinner reported in this issue. Sir George Edwards said there could be no question of debating whether this country could afford an aircraft industry. The hard fact is that the U.K. cannot afford to be without one. Sir Roy Dobson pointed out, as indeed he might with considerable pride, that in things like VTOL and variable-sweep aircraft this country was ahead of the rest of the World. His classic understatement was to remark that it was a *pity* that no one bought anything! Without Government orders the industry could not keep its staffs together. And if teams broke up the country might well lose brilliant individuals who would go abroad.

We will add the comment that it seems the negation of planning to export talent instead of the products of gifted brains.

It is still an absolute mystery to us why the Royal Air Force is prevented from ordering existing designs of British VTOL aircraft to work out their operational utilization. While we are debating what to do, someone in Europe will get a competitor flying.

D

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Matters of Moment

Plain Speaking at Boscombe

WITH Sir George Edwards roundly asserting that it was nonsense to debate whether we could afford an aircraft industry because the country could not afford to be without one, and Sir Roy Dobson making a heartfelt plea for more Government support for new projects and a 7-10-year plan for the industry, Boscombe Down's Aircraft Industry Dinner last week was an occasion as notable for its plain speaking as it was for its good company.

Earlier, the Commandant, AIR CDRE. J. R. ROULSTON, C.B.E., D.S.O., D.F.C., had extended a warm welcome to the guests. He mentioned in particular the Vice-Chief of the Air Staff, Air Marshal Sir Edmund Hudleston, K.C.B., C.B., C.B.E. —who, he said, represented many impatient but ultimately satisfied customers. He also mentioned by name the new C. in C., Maintenance Command, Air Marshal Sir Leslie Dalton-Morris, K.B.E., C.B., and expressed regret, which everybody shared, that Sir Frederick Handley Page could not be present.

The Commandant drew attention to the importance of the weapons system concept; among the guests were many representatives of the companies involved. He had something especially nice to say about the excellent spirit of co-operation that existed between the Establishment and the many "company reps." stationed there. He expressed his conviction that Boscombe Down had in front of it a long and busy future.

In reply on behalf of the guests, SIR GEORGE EDWARDS, C.B.E., B.Sc., Hon. F.R.Ae.S., Hon. F.A.I.S., referred to the "fairly majestic burdens" which the major groups in the aircraft industry had to carry. He spoke of the importance of personal relationships and contacts in industry—in which respect aviation was more favoured than most. And the Boscombe Down Industry Dinner, he considered, to be one of the "finest personal occasions in aviation."

The country, said Sir George, could not do without its aviation industry and it was nonsense to debate whether we could afford one. He paid a sincere tribute to the A. and A.E.E. and its integrity of purpose. He hoped that a great team would go on from strength to strength.

Proposing the toast to the aircraft industry, SIR GEORGE GARDNER, K.B.E., C.B., D.Sc., B.Sc., M.I.Mech.E., F.R.Ae.S., Controller of Aircraft at the Ministry of Aviation, gave a fascinating account of the industry's history. Its corner-stone, he said, was its personalities who were to be found at all levels. All were bound together in a spirit of common endeavour and a bond of affection. He felt privileged to work in the "dynamic environment" of the industry, which was an exciting and rewarding experience. Like all other British institutions, the aircraft industry was adaptable; it bent and it stretched, but it never broke.

In reply, SIR ROY DOBSON, C.B.E., Hon.F.R.Ae.S., started by referring to the high annual rate of export income earned by the British aircraft industry, but went on to say that if no new projects were forthcoming, there would be no exports in the future. The aircraft industry could produce aircraft, aero-engines and missiles as good as, and as cheap as, those anywhere else in the World—if given a chance to do so. It was necessary to the country and to its Services that there should be a strong and virile aircraft industry in Britain. But contracts were needed in order to maintain the industry's lead.

He referred to the excellent design teams that had been built up and made a plea that they should be used and supported. Without orders, the industry would not be able to keep the interest of its technical staff and there was a temptation for technicians to go to the United States. In things like VTOL and variable-sweep aircraft, we were ahead of the World; but so far no one had bought anything. The immediate problem was to get support for projects such as these.

We must also, said Sir Roy, persuade the Government to have a 7-10 year plan and to tell the industry what would be needed in that period. At no time more than the present did we need a strong aircraft industry. It was a pity that no one had told the Treasury that the diabolical 1957 White Paper was now obsolete.

Europe's Space Launcher

WITHIN three weeks, Europe should have settled once and for all the question of whether or not it is to have a unified space launcher organization. A draft Convention prepared by the British and French Governments was discussed at Lancaster House last week with delegates from Australia, Belgium, Denmark, the Netherlands, the Federal Republic of Germany, Italy and Spain. Observers representing Norway, Sweden, Switzerland, the Council of Europe and the Preparatory Commission of E.S.R.O., were also present. A final draft Convention has been prepared for governments to sign.

Proposals provide for the organization to carry out an initial programme of work for the development of a launcher using Blue Steak as the first propulsion stage, a French rocket as the second stage and a third stage to be developed under the leadership of the Federal Republic of Germany. The organization will also develop as part of its initial programme a series of satellite test vehicles to prove the launcher system. The programme provides for the first firing of the complete three-stage launcher to take place from Woomera in the summer of 1965. An attempt will be made in this trial to establish a satellite test vehicle in orbit.

The Convention provides also for an elaborate programme of advanced studies to be carried out in the first two years

SKYWAYS EQUIPMENT. —Route proving trials are being conducted this month by Skyways with the first Avro 748 (see page 591). The new British Dart-engined feeder-liner is seen here outside the terminal building at Lympne.

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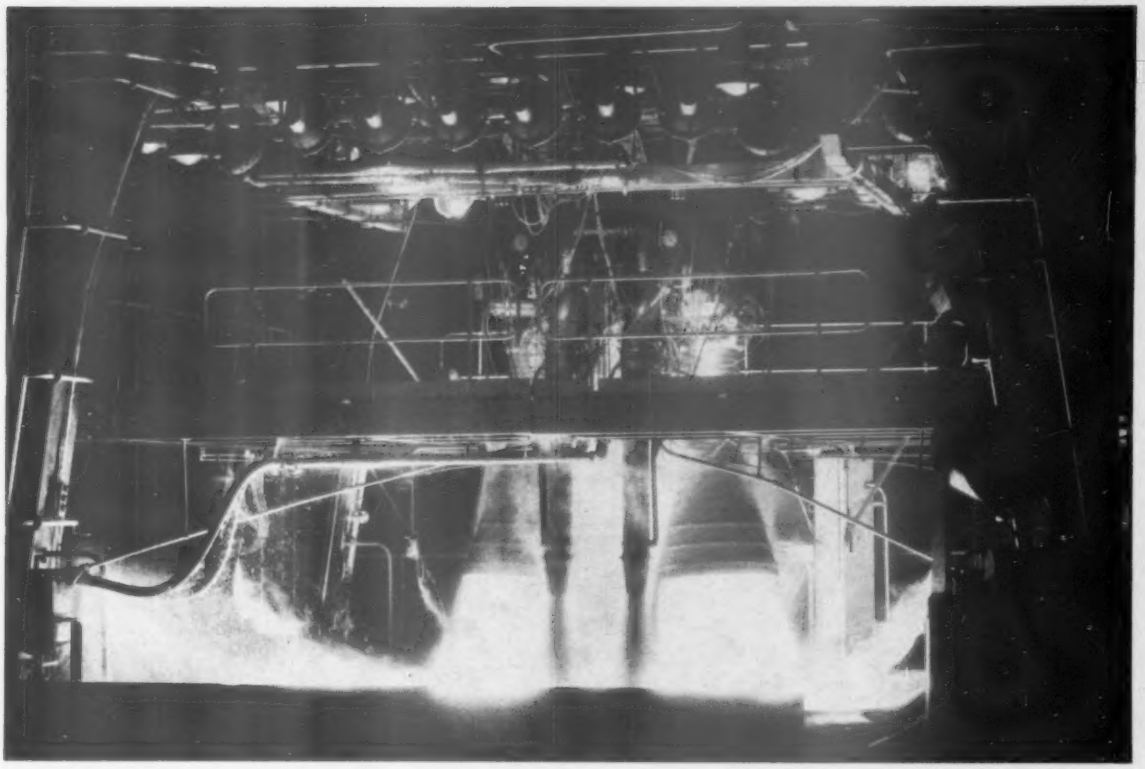


SPACE BOOST.—With nine-nation agreement in sight on the structure of the European Launcher Development Organisation (ELDO), Blue Streak is expected to achieve its first firing at Woomera in 1963. When it does so it will be propelled by two Rolls-Royce RZ.2 rocket engines—seen here being static tested at Spadeadam earlier this year.

of the initial programme with a view to formulating proposals for a second programme. An informal group has been set up to make arrangements for the preparation of the work of the organization pending governments' decisions on the Convention. This group will plan the arrangements for establishing the organization and invite countries to prepare for the placing of contracts for the various parts of the programme on which work has not yet started.

It is proposed to carry out vehicle development by means of contracts placed either by the organization itself or by the governments of member States on its behalf. The allocation of contracts will be determined by the organization on the basis of a rational distribution of work among member States, having regard to technical and economic criteria.

Arrangements will be made for technical information acquired in the course of development to be freely exchanged between the various countries, each of which will be given an opportunity of joining in the scientific, engineering and other activities. Dissemination of technical information and knowledge will be facilitated by the employment of nationals of each member State in the work being undertaken on behalf of the organization in government establishments and industry.

During a Press conference on Nov. 3, Mr. Peter Thorneycroft revealed that the first firing of a Blue Streak at Woomera was scheduled for 1963. The original plan discussed at Strasbourg was for this to occur in 1962. He also said that any "shortfall" in the budget arising from the dropping out of certain countries—i.e., Norway, Sweden and Switzerland—would be made up by the larger countries involved.

B.O.A.C. Radioactivity Checks

FOLLOWING the news of a high degree of radioactivity found on a Lufthansa Boeing 707 (THE AEROPLANE AND ASTRONAUTICS, Oct. 26) and our notes giving some indication of the potential hazard involved, has come some information from B.O.A.C. about the precautions taken in this direction at London Airport. For the past 18 months, says the Corporation, a careful check has been made on both aircraft and ground staff in order to ensure that any contamination of airframe exterior surfaces would not reach dangerous proportions undetected.

More recently, with the resumed nuclear test programme by Russia, there has been an increase in radioactive contamination of some of the Corporation's aircraft, notably those operating the Atlantic routes. This, we understand, is nowhere near the danger level and is no hazard to passengers or crew. However, as the cleaning staff would be exposed to whatever hazard may exist, this has inevitably led to a stepping up in the precautionary measures adopted. For example, blood counts are now being taken from airframe cleaners and they are also being issued with radiation badges to wear on their overalls.

As we indicated in our issue for Oct. 26, one of the ways of dealing effectively with radioactive particles adhering to the outside of an airframe would be to give it a good hosing down with water. We understand, however, that at the present time the radiation level on B.O.A.C. aircraft is not high enough to warrant this treatment, which although simple, would inevitably constitute something of a problem in the rapid and highly organized turn-round procedure.

Powerplant Contributions

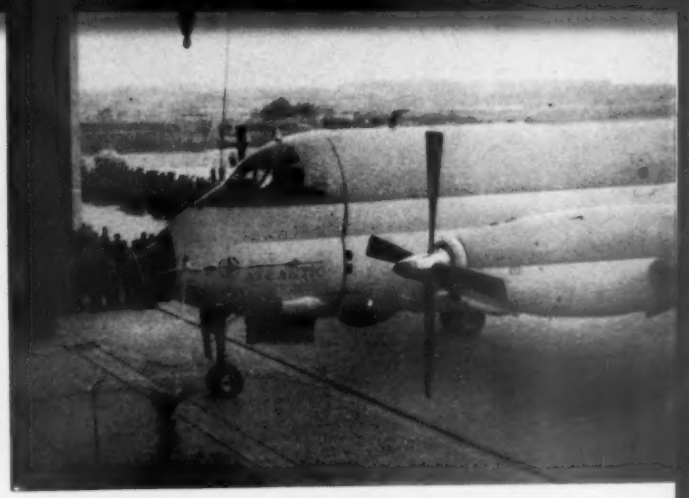
EVERY second of the day and night £2 14s. 4½d. is earned by the British aero-engine industry from its sales of powerplants and spares abroad. This is the remarkable figure that is represented by the total engine export earnings of £64,180,024 for the first nine months of this year. Even broken down to £9,800 an hour or £163 a minute, this is an impressive enough achievement.

It is interesting to note, too, that the value of powerplants installed in airframes sold overseas is not included in these figures. Nor do they contain the large "hidden" contribution which accrues from the royalties paid by overseas manufacturing licensees.

Since the War, the powerplant side of the aviation industry has brought in no less than £420 million worth of export earnings. More than two-thirds of this has been earned during the past 4½ years. At the rate of progress represented by the January to September figure, disclosed recently by the S.B.A.C., this year's likely engine export contribution works out at £85.4 million—which compares with the figure of £73.7 million for last year.

Matters of Moment . . . .

Breguet Atlantic Presentation



FOLLOWING its naming by Madame Pierre Messmer, wife of the Ministre des Armées, the Breguet 1150-01 Atlantic was unveiled to a large number of NATO military and government officials at Toulouse-Colomiers on Nov. 3.

Recently completed in the new assembly plant of S.A. des Ateliers d'Aviation Louis Breguet at the airfield, this first prototype of the Atlantic twin-engined anti-submarine and reconnaissance aircraft had then logged some 12 hours' flying since its maiden flight on Oct. 21. Painted in French Naval markings and almost fully equipped, including autopilot and the majority of its navigational and ASW weapons systems, the 1150-01 represents a major step in the progress of the first completely co-operative programme undertaken by the European aircraft industry.

In this consortium Breguet have overall responsibility for the design and development of the aircraft, together with fuselage production and final assembly. Sud-Aviation are manufacturing outer wings; Dornier in Germany, rear fuselage and tail units; and Fokker in the Netherlands, wing centre-sections and engine nacelles. Tyne RTy. 20 Mk.21 6,105 e.h.p. turboprops are being supplied by Rolls-Royce in co-operation with Hispano-Suiza, and de Havilland are manufacturing the 16-ft.-dia. propellers with Ratier.

The Belgian component of the consortium, ABAP, which includes Avions Fairey, SABCA and Fabrique Nationale, is also well committed. Avions Fairey, SABCA and F.N. are to build airframe assemblies, F.N. together with M.A.N. in Germany are participating in powerplant work, and SABCA and F.N. are co-operating with Hispano-Suiza in producing landing gear.

Three Tynes for the first prototype have been lent by Rolls-Royce and the company is to supply the powerplants for the second (now nearing completion) and third prototypes, and the first production aircraft. To date 27 have been ordered for the French Navy and approximately 20 by Germany. Total orders are expected to reach over 100 aircraft.

Designed to replace the Lockheed P2V Neptunes in service with NATO maritime squadrons, the Atlantic has a maximum take-off weight of 90,400 lb., a maximum speed of 330 knots and a patrol speed of 170 knots. Its operational ceiling is 33,000 ft., and with a 12-18-hr. endurance it has a maximum range of 5,000 n. miles. Equipped with French radar and American ASW systems similar to those in the Neptune, the Atlantic is capable of carrying standard NATO armaments, including French or American depth charges, air-to-surface rockets, homing anti-submarine torpedoes and under-wing pylon-mounted air-to-surface missiles with nuclear warheads for use against submerged submarines.

Anglo-Italian Air Talks

A BRITISH delegation headed by Mr. Michael Custance is at present in Rome to discuss a possible revision of the Anglo-Italian air agreement. Our Italian correspondent describes the atmosphere in which these talks are being held as "somewhat tense," because of Italy's hardening attitude towards traffic rights.

The meeting is examining the routes, frequencies and possible future expansion of B.E.A., B.O.A.C. and Alitalia services. One of Italy's major aims is a more generous allocation of fifth freedom rights at London for her transatlantic traffic. At present, Alitalia is allowed five services a week, increasing by one a week per year. A demonstration of Italian feelings was given last June when, with the minimum of warning, B.O.A.C. was prevented from operating services at Rome within three hours of any equivalent Alitalia service.

Negotiations between Italy and the U.S. have also reached a critical stage, our correspondent writes. Talks were suspended last month after Italy refused to agree to the U.S. request for certain traffic statistics to be provided. Italy has since made a compromise proposal, but this has been formally rejected by the U.S. At the time of writing, Italy's reply to the U.S. rejection is being prepared.

Informed opinion in Rome believes that the Italian attitude has hardened very considerably and that, if the U.S. are not willing to grant them rights to fly to the Pacific coast, some form of retaliatory action may be taken. This might amount to renouncing the existing treaty or taking unilateral action, as she did against B.O.A.C. last June, and imposing some restriction on the operations of T.W.A. and/or Pan American.

Accident Statistics

SAFETY standards of independent airlines and charter aircraft will be the subject of a 30-minute adjournment debate in the House of Commons next Tuesday, Nov. 14. The question is also expected to be raised when the B.E.A. and B.O.A.C. Report and Accounts are debated in the near future.

Meanwhile, further statistics were given in the House on Nov. 6 for the fatality record of the Corporations, and the Independents (see our issues for Nov. 2 and Oct. 26). These showed that the two Corporations flew 18,981.5 m. passenger miles on scheduled operations in the years 1952 to 1960 inclusive, with 230 passenger deaths, while the independents flew 1,275.2 m. passenger miles for 38 passenger deaths. These represent rates of 1.21 and 3.0 fatalities per 100 million passenger miles respectively.

On non-scheduled passenger carrying public transport flights, B.O.A.C. flew 886 m. passenger miles without fatality, while the independents (BIATA members only) flew 5,278.9 m. passenger miles with 177 fatalities. This brings the overall independent fatality rate up to 3.3 deaths per 100 million passenger miles. B.E.A. does not keep a record of non-scheduled flights, but there were 22 passenger fatalities on these operations by B.E.A. in the period.

Jersey Reorganization

AS forecast in THE AEROPLANE AND ASTRONAUTICS for Oct. 26, public investment is to be invited in Jersey Airlines, which was owned until recently by Mr. M. L. Thomas (75%) and B.E.A. (25%). A new company was registered in Jersey on Nov. 4, with the name Channel Islands International Airlines Corporation and a nominal authorized capital of £1 million. Shares in the new company are to be offered to the public.

CIAC (the authorized short form of the company title) will acquire the whole share capital (£200,000) of Jersey Airlines Development Corporation, Ltd. Operations of the company will continue under the name Jersey Airlines, and Mr. Thomas will continue in office as founder-chairman of CIAC.

NATO Requirements—More Co-operation

ATTENTION switched at the beginning of this week from NATO's future V/STOL fighter requirements to those for a heavy transport with similar capability, defined in the BMR-4 specification. The British Aircraft Corporation, entering for the first time into an agreement with a Continental firm, is to submit a joint design in this category with Fin Meccanica of Rome. Dornier has also been approached with a view to contributing toward the design.

This, it is said, is to be based on the Bristol 208 of which two versions have been mentioned. One, with a STOL performance, employs four Bristol Siddeley BS.53 Pegasus lift/thrust engines, podded in pairs. The other, with wingtip-mounted lift-fan engines (Bristol Siddeley have design studies for an engine of this type also) would have VTOL characteristics.

Discussions on the project between B.A.C. and Fin Meccanica are still in the preliminary stages, but it has been said that, should NATO select the design, production will take place, in whole or in part, in both the U.K. and Italy.

Aviation News in General

FIRST FLIGHT AT KANPUR.—First flight of an Indian-built Avro 748, assembled from Avro-produced components, was on Nov. 1. Tooling for complete production at Kanpur is now under way.

MIRAGE NAVIGATION.—For its 30 Mirage III fighters, due to enter service in 1963, the R.A.A.F. has specified the Sperry twin-gyro stable platform for providing attitude and heading information. Value of the order to Sperry is reported as being about £500,000.

BLINDER AND FIDDLER.—Further confusion over the code-names of the newest Russian aircraft will arise from the recent switch of the name Blinder from one aircraft to another. At one time applied to the Yakovlev long-range twin-jet interceptor, it is now used for the rear-engined supersonic bomber which became widely, but unofficially, known as Beauty after its surprise appearance at the Tushino display in July. The Yakovlev interceptor is now officially Fiddler. Code-names allotted to other new aircraft seen at Tushino are not at present approved for publication.

SPRAYMAT LICENCES. — Napier now has four overseas licensees for its Spraymat de-icing system, each being responsible for the manufacture and sale of Spraymat in its own country. In France it is Bronzavia of Courbevoie (Seine); in Germany, Westfalische Metall Industrie, K.G., of Lippstadt; in Japan, Mitsubishi Heavy Industries; and in the U.S.A., the Flight Support Division of Pacific Airmotive.

STOL AIDS.—A close-up of the prototype Breguet 941 STOL transport showing the 44% span double-slotted flaps, leading edge slats and very large propellers which provide deflected slipstream over the wings. As shown here, the 42% span ailerons can also be drooped to match the flap angles during take-off and landing.

Photograph copyright "The Aeroplane and Astronautics"

Airport will be used for flying displays. Arrangements are now being made to allow the temporary importation of exhibitors' wares. Closing date for applications—to the Salone Secretariat General, Corso Galileo Ferraris, 60, Turin—is Mar. 24, 1962.

ALTIMETER EXAMINATION. — The three altimeters from the DC-6 in which Mr. Dag Hammarskjoeld was killed on Sept. 18, have been sent to the U.S. for examination by the C.A.B. An altimeter error of 1,200 ft. has been mentioned in unconfirmed reports.

INTERNATIONAL STUDY. — A $300,000 contract has been placed by the F.A.A. with Robert R. Nathan Associates Inc. and System Analysis and Research Corporation to conduct "a broad study of international aviation problems," to help future planning in the U.S.

HILLER P.V.—After six months of secret testing Hiller has now revealed its private venture "Ten99" six-seat helicopter. Powerplant is a Canadian Pratt & Whitney PT6 turbine. Overall dimensions of the machine are about the same as for the three-seat Hiller 12E.

HERALD TOUR. — A tour of Southern Europe, the Near East and East Africa by a Handley Page Herald began last Monday, Nov. 6. This latest Herald tour is being made by the prototype long-fuselage Series 200, of the type to be operated by Itavia in Italy next year. Proving flights over Itavia routes will be made in the course of the five-week tour.

AIR BP IN ITALY.—Air BP, who in Italy operate fuelling services through the RIFAER company in which it owned half the share capital, has now acquired complete ownership of the company by purchasing the shares held by AGIP.

ITALIAN FARNBOROUGH.—Italy's Salone Internationale dell'Aeronautica, to be held at Turin from May 24 to June 3, 1962, will alternate biennially with the Paris Show, it is planned. Site of the Salone will be one of the pavilions of the current "Italia 61" exhibition. Caselle

COMPUTER PURCHASE.—Elliott Brothers (London), Ltd., who are to produce under licence from the Autonetics division of North American the Verdan digital computer (used in inertial guidance systems), has bought six complete units and six sets of components for assembly in England. Deliveries will begin next year.

SHOWING THE FLAG.—A number of British manufacturers are exhibiting at the Indian Industries Fair which opens in New Delhi on Nov. 14. The S.B.A.C. has organized a combined stand with the title "The British Aircraft Industry."

SAFIR SATISFACTION.—Another five Saab 91D Safirs have been ordered by the State-run civil flying school at Eelde, Holland. Eighteen 91Ds were obtained in 1959-60 replacing eight of the 91A type purchased in 1948.

MORE POTENT F-105s.—Future versions of the F-105D Thunderchief are to have, in addition to usual armament combinations, a "highly sophisticated reconnaissance system superior to any now in existence." Continuing deliveries of this aircraft have boosted Republic's consolidated sales for the first half of 1961 to $172,228,431, a net income of $5,187,283. Comparable figures for the same period last year were $67,659,241 and $839,378.

HELP FROM THE SKY.—The 90,000 who live in the New South Wales outback are to have the benefit of an aerial ambulance service beginning, it is hoped, next year. The Royal Australian Flying Doctor Service operating from 13 bases now provides this kind of service for two-thirds of the remote Australian inland.

D.H. AIRLIFT. — An airlift of 3,000 troops in 14 days is being undertaken by three Caribou (operated for the U.N. by the R.C.A.F.) and Comet 4Cs of Middle East Airlines. From El Arish in the Gaza strip the Caribou are flying 1,500 Scandinavian troops of the United Nations Emergency Force to Beirut. From here the journey to either Copenhagen or Oslo is made by M.E.A. Comet. On the return flights another 1,500 replacement troops are carried.

ENGINE OVERHAULS. — Rolls-Royce Darts in service with T.C.A. are now approved for an overhaul life of 3,500 hr. The Allison 501-D13 turboprop in service with Eastern Air Lines and Pacific Southwest Airlines has been approved by the F.A.A. for 2,000 hr. between overhauls—the first U.S. turboprop to reach this figure.

APPROVED. — Hordern-Richmond, Ltd., have obtained F.A.A. type design and installation approval for the manufacture of rotor blades for the Bell 47 and Hiller UH-12 series helicopters. The company is now permitted to supply new blades and to overhaul existing blades for U.S.-registered machines.

OPTIONAL READING 19.—After going to press with p. 619 of this issue, a small error in the table has been pointed out by C.C.J. Under "Assumptions" (top right) the weight error should be "1.5%" and not "1-5%."

STRATOLIFTER LOADING. — A Boeing-developed cargo-loading system consisting of a ball transfer plate and roller conveyors with pallet restraining lock is to be used in all C-135 Stratolifters. The system can also be adapted to the KC-135 Stratotanker.

ALOUETTE ORDERS.—Sud Aviation now holds firm orders for 59 Alouette III helicopters. Export orders from six countries—the most recent from Rhodesia—account for 47 of these.

HELICOPTER TURBINE. — The Garrett Corporation's AiResearch Manufacturing Division has produced a new gas turbine powerplant for helicopters. Designated the Model 331, it has been test flown in a Republic Lark (licence-built Alouette II).

PERSONAL FLIGHT GUIDE.—To meet the requirements of private and executive pilots, the Ministry of Aviation is to publish this month the first *General Aviation Flight Guide*. It will take the place of C.A.P. 111 *Radio Facility Charts* and will consist of selected pages from the *U.K. Air Pilot* in a flexible loose-leaf cover, kept up to date by monthly supplements. The price, from H.M.S.O., will be £1 2s. 6d. (plus 1s. 3d. postage); the supplement service will cost 10s. a year post free.

DISCOVERER DOWN. — A rare failure in the Discoverer launching programme occurred on Oct. 23 when the 33rd vehicle of the series failed to go into orbit. It appears that the second stage of Thor-Agena B shut down too soon.

ITALIAN SATELLITE.—Italy expects to launch a small Earth-satellite in about 18 months' time from a platform built in international waters between the Red Sea and the Arabian Sea. Project is being prepared in conjunction with the U.S. Government, according to Signor Andreotti, the Italian Defence Minister.

SKYBOLT AWAY.—The first drops with a dummy Skybolt ALBM have been made at Eglin A.F.B., Florida. Four of the missiles in their latest form — the sphere-cone configuration — are seen here under a B-52H.

HIGH LARK.—A two-stage Skylark fired from Woomera on Nov. 2 ascended "well over 100 miles." The third in a series of four instrumented by NASA, the experiment was concerned with "the intensity and distribution of ultra-violet radiation reaching the Earth in the Southern Hemisphere."

CHIMPONAUT.—Latest date for the attempt to orbit a chimpanzee in a Mercury capsule is Nov. 14, according to NASA. Recovery is planned at the end of three orbits.

IN ORBIT.—Discoverer XXXIV was launched by a Thor-Agena B into polar orbit from Vandenberg A.F.B. on Nov. 5.

SCOUT LOSS.—A four-stage Blue Scout rocket was destroyed by the range safety officer at Cape Canaveral on Nov. 1 after veering off course. It had been intended to place in orbit a radio-beacon satellite as a test for the Project Mercury ground-tracking network.

AERO/SPACE.—The Soviet Air Force monthly journal, *The Air Force Bulletin*, is changing its title as from January, 1962, to *Aviation and Cosmonautics*. The magazine covers progress in tactics, engineering and other fields in both the U.S.S.R. and foreign countries. It is not normally obtainable outside the Soviet Union.

Commercial Aviation Affairs

AVRO DELIVERIES.—To fly later this month at Woodford, the second production Avro 748 will be the first of nine ordered by Aerolineas Argentinas. Its delivery to Argentina will be made after flight tests and the grant of the British C. of A.

FLEET RETIREMENTS. — B.O.A.C. is to retire its DC-7Cs from April, 1962, and its fleet of 14 Britannia 102s towards the end of 1962. The DC-7F freighter conversions will be retained. The Corporation has two of these and a third DC-7C will probably be converted and retained. B.O.A.C. at present has a total of 10 DC-7C/Fs.

DC-8 CERTIFICATE.—F.A.A. approval has been given to the new "4%" wing on the Douglas DC-8, on which the chord is increased by 4% from root to tip. Douglas has announced orders for 16 DC-8s with the new wing from Alitalia, Japan Air Lines, K.L.M., National Air Lines, Trans Caribbean Airways and Philippine Air Lines. In addition, Alitalia, C.P.A. and United will modify a total of 12 DC-8s now in service.

BOEING'S MILLION.—More than a million flight hours have been amassed by the Boeing 707/720 since service began in October, 1958. The total was reached with 236 aircraft in service with 23 airlines and 95% of the total was revenue flight time.

LUFTHANSA JETS.—A daily service between London and Frankfurt is now offered by Lufthansa with turbofan Boeing 720Bs in place of the Viscounts used hitherto.

JET CHARTER AIRLIFT.—Two Braniff Boeing 707-220s, each arranged to accommodate 147 passengers, averaged 11 hours a day for 39 consecutive days to complete the airlift of more than 5,000 passengers on return flights between Jamaica and Panama and 28 U.S. cities. The operation was a charter arranged by Gibson Refrigeration as a reward for its outstanding dealers and their families. One 707 operated for 24 days from Sept. 5 and was then relieved by the second which completed the charter operation by Oct. 13.

MINISTERIAL VISIT.—Mr. Thorneycroft, Minister of Aviation, flew to Washington last week for discussions with Mr. N. Halaby, the F.A.A. administrator. He will also have talks with the Canadian Government before his return.

U.S. AIRLINE LOSS.—T.W.A. has reported a net loss of $12,733,000 (about £4,550,000), after tax credits, for the first nine months of 1961—by comparison with a net profit of $6,083,000 (£2,175,000) for the same period of 1960. The passenger load factor over the total system dropped from 65.1% to 55.9%. Interest payments amounted to $13,068,000 (£4,680,000) and there was a loss of $3,077,000 (£1,100,000) on the sale of aircraft.

THIRD-CLASS FARES.—Continental Air Lines proposes, subject to C.A.B. approval, to introduce a third class of turbojet fare on Dec. 1. This will be about 25% lower than present coach-class fares. Other U.S. domestic airlines have recently announced plans to raise certain turbojet fares, but Continental believes that the new fares will generate enough new traffic to increase its profits.

CEYLON IN POOL.—Under the agreement signed with B.O.A.C., Air Ceylon will join the pool with B.O.A.C., Air India and Qantas on the Far East route. B.O.A.C. introduced on Oct. 30 an additional weekly Comet flight to Colombo which will continue until April 1, 1962, when the new agreement takes effect.

INDO-FRENCH AGREEMENT. — A revision of the Indo-French air agreement permits Air India International to operate four services a week (instead of three) to Europe and the U.S. through Paris.

AIR INDIA PROFIT.—In its first year of North Atlantic operations, Air India increased its net surplus from £202,350 (1959/60) to £509,775. Capacity offered during the year increased by 72.7% and traffic by 41.2%. The overall load factor fell from 58.2% to 47.3%.

RECORD EARNINGS. — Trans-Australia Airlines achieved a record profit of £A383,000 in 1960/61 (to June 30), and highest-ever earnings of £A16.5 million.

KUWAIT RESULT.—Kuwait Airways has reported an increase of 26% in the number of passengers carried in 1960-61. Similar increases were made in passenger-miles and load ton-miles performed. During the year 16 airlines were serving Kuwait regularly and Kuwait Airways carried 35% of all passengers travelling over the routes which it serves.

EASTERN RESULT.—A profit in 1962 of up to U.S. $12 million is forecast by Eastern Air Lines, after further losses this year. Eastern lost $3.6 million in 1960 and $6,380,000 in the first six months of 1961. E.A.L. president M. A. MacIntyre blames a slowdown in traffic volume, rising costs, and the fact that fares have not risen sufficiently in relation to the national economy in recent years.

ARGOSY DELIVERY.—The first of three Argosy 102s for B.E.A. was delivered on schedule on Nov. 6. It is now at Stansted for crew training and a series of route training flights will begin on Nov. 14. Full scheduled service begins on Nov. 26.

(*Continued on page 618*)

Air Transport

Proving the Avro 748

A 160-HOUR schedule of route-proving flights with the Avro 748 began last Monday, Nov. 6. Undertaken by Skyways crews using the first production aircraft (G-ARMV), they will be concentrated in two nine-day periods with one intervening day for servicing. This intensive route flying will meet the final requirement of the A.R.B. before the grant of the full C. of A., which is therefore anticipated before the end of the year.

Skyways Coach Air, with three Avro 748s on order, will not complete acceptance of the first until next March, in time for its full introduction on the coach-air services from April 1. The company's participation in the necessary route proving meanwhile provides an opportunity for continuation training of its six pilots so far checked out on the type at Woodford, as well as general experience of the 748 on the ground and in the air. It is, in any case, an A.R.B. requirement that these flights, which are comparable to the functioning and reliability phase of F.A.A. certification testing, should be undertaken wholly by an airline, and not by the aircraft's manufacturers. Six more pilots are to be checked out on the 748 in due course; all must complete 50 hours before they can fly it on scheduled services.

The Avro 748 arrived at Lympne for the trials on Nov. 1, and a number of flights were then made to measure its take-off and landing performance from grass (Lympne, owned by Skyways, has a 3,600-ft. grass strip, no concrete runway or night flying facilities). Earlier measurements had been made on the grass at Baginton and Hatfield.

The route proving will be principally over the routes on which the Avro 748 will operate next season—to Beauvais, Vichy and Montpelier. To obtain the planned high utilization of nine hours a day, other airports are being used during the hours of darkness. On its last departure of the day from Lympne, the 748 flies to one of the more distant coach-air terminals, returning to either Manston or Gatwick to turn-round during the night, and then flying another of the longer sectors before returning to Lympne next morning. This kind of arrangement is typical of the actual coach-air operations, which concentrate the short Lympne-Beauvais flights into the hours of daylight.

With three Avro 748s in operation by next May, Skyways Coach Air hopes to achieve a utilization rate of 2,200 hr. per aircraft in the first year, including charter flying during the off-peak winter months. This compares with about 1,100 hr. each with its present fleet of four DC-3s, for which little off-peak utilization has proved possible. In the peak period, the 748s will be flying as many as 14 hr. in a day to provide the planned 150,000 seats on coach-air services through Lympne next year.

If this figure is achieved, it will be an increase of nearly 50% over the 1961 total of 105,000 passengers. Further development of the coach-air services is to a large extent dependent on the attitude of the French Government, which has imposed a limit (below 3,000) on the number of flights Skyways may operate into France annually.

Skyways' Avro 748s are laid out for 44 passengers in 11 rows of Aircraft Furnishing reclining twin-seat units at 36-inch pitch. A small galley and the toilet are at the rear, and all the baggage is carried between the cabin and the flight deck. The aircraft are designed for two-crew operation and will carry two stewardesses. Coach Air Dakotas—which will be retained in the Skyways' fleet—seat 36 passengers and carry only one stewardess.

ON THE GRASS.—As related above, Avro 748s will be in service on the Skyways Coach Air Services from Lympne next year. Before route proving trials with 748 began this week, measurements were made of its performance off the grass at Lympne, which has no runway.

Photograph copyright "The Aeroplane and Astronautics"

Certificate for the S-61

ON Nov. 3 the Sikorsky S-61L became the first twin-turbine helicopter to be certificated in Category A and B of C.A.R. Part 7. Category A is significant in permitting continued operation of multi-engined transport helicopters after failure of one engine, and thus making all-weather instrument and flight operations possible. The S-61L certificate does not require automatic stabilization equipment to be fitted, although this is available if required by operators. Certificated gross weight is 19,000 lb., allowing the S-61L to carry 28 passengers, two pilots and a cabin attendant. Permissible high speed is 150 m.p.h.

Following the grant of the F.A.A. certificate, Los Angeles Airways was to take delivery of its first S-61L this week and the second later this month, with services to begin in December. Chicago Helicopter Airways will receive its first S-61L early in 1962. Both airlines have four of the big helicopters on order; each is powered by two 1,250 s.h.p. General Electric CT 58-110 turboshaft engines.

Sierra Leone Airways Expands

NON-STOP service between Freetown and London will be provided on a weekly basis from Nov. 16 by Sierra Leone Airways. As we noted in our previous issue, the service will be operated by British United Airways using a Britannia 317. B.U.A. has two of these Britannias, which are unique in being powered by Proteus 757 engines (see our issue for Sept. 28, p. 422); with water injection, these engines maintain power in "hot and high" conditions to make possible the non-stop 2,646-naut. mile leg from Freetown to London. The service will operate from London (Gatwick) each Thursday night, returning to London on Friday night.

The Britannias, laid out for 64 economy and 16 first-class passengers, will carry three Sierra Leone stewardesses in national dress and will fly in B.U.A. livery with the Sierra Leone Airways crest.

During September, the Twin Pioneer operating domestic routes in Sierra Leone achieved a load factor of 78%. Later this month a Heron will be added to the fleet and services to neighbouring African States are being planned.

Air Transport . . . .

Syrian Arab Airways

THE dissolution of the *entente* between Egypt and Syria in September had its inevitable sequel on Oct. 16 when the Syrian Council of Ministers revoked the merger of Syrian Airways and Misrair, which had formed United Arab Airlines.

A new airline, wholly government-owned, has been established in Damascus with the name Syrian Arab Airways. The chairman and managing director is Toufic Karawi, a senior Air Force officer. Domestic operations, which had been suspended on Sept. 28, were resumed on Oct. 21, and the new company began international operations to Kuwait, Dhahran, Doha and Qatar on October 24.

Charter Newcomers

APPLICATION has been made to the A.T.L.B. by the Black Isle Air Service for a licence to operate scheduled services between Inverness and Glasgow, Edinburgh and Prestwick. The company—the registered name of which is Capital Services (Aero), Ltd.—has a Piper Aztec with which it would operate up to six services a week in each direction to connect with trunk services at the Scottish terminals. Proposed return fares (described as first class) from Inverness are £7 to Glasgow, £7 10s to Edinburgh and £10 10s. to Prestwick. Freight rates would be 1s. 4d. per kg. to Glasgow and 1s. 6d. per kg. to Edinburgh and Prestwick.

The latest issue of Civil Aviation Licensing Notices, giving details of this application, also contains information about two further applications from Caledonian Airways (Prestwick), Ltd. This company, formed earlier this year, has previously applied for licences to fly a number of inclusive tour services, including one between London and Moscow, using DC-7Cs. The new applications are for three flights from Jamaica to London, and for 12 group charter flights at monthly intervals between London and Auckland, New Zealand.

Neither Black Isle Air Service nor Caledonian Airways (Prestwick), Ltd., appeared in the list of private air companies supplied by the Minister of Aviation in a written answer in the House on Oct. 23 (see our previous issue). The former company does not require an air operator's certificate since the Aztec weighs less than 5,000 lb.

Another new name among the independent operators is British Executive Air Services, Ltd. This is a subsidiary of Pressed Steel Co., Ltd., formed by an amalgamation of the latter's Air Services Division and Oxford Aviation Co., Ltd., at Kidlington. This company will provide a variety of services for the flying businessman, including advice on operating executive aircraft, along the lines previously offered by the Air Services Division. In addition, the company's aircraft and pilots will be available on charter for business flights in the U.K. and Europe on an individual basis, or for a specified number of hours a year.

The Independent Decline

TWO more of Britain's independent airlines—both with good records of service in the past year—were reported to be in financial difficulties last week. They are Air Safaris and Tradair.

Tradair, Ltd., which was incorporated at the end of 1957 and has operated principally on inclusive tours, has had its affairs placed in the hands of a receiver by Barclays Bank. Although the seven Vikings are continuing to operate to meet the company's commitments, the two Viscounts (ex-Aer Lingus) have been grounded and approximately one third of the staff of 200 have been dismissed.

Based at Southend, Tradair was founded by Mr. E. S. Hanks and Mr. N. Monnickendam, with a nominal capital of £100,000 and an issued capital of £4,500. Mr. Monnickendam succeeded Mr. Hanks as chairman last May, since which time they have been joint managing directors. Other senior executives are Mr. H. H. Porter and Gp. Capt. J. G. Glen, personal assistants to the managing directors, and Capt. V. J. Stimpson, chief pilot and operations manager.

Tradair gained the distinction, earlier this year, of being congratulated by B.E.A. on its idea to operate scheduled services for group bookings by travel agents. These applications were heard by the A.T.L.B. as part of Public Hearing No. 21, the European Routes Rights Case. Delays in obtaining these and other licences have been blamed by Tradair for its present situation. A favourable decision from the Board, said Mr. Monnickendam last week, would automatically resolve the position.

Air Safaris suspended its operations on Nov. 2 through lack of working capital, and after one of its Vikings had been impounded in France on the action of a travel agent. A spokesman said that "negotiations to meet new Government requirements have been delayed and Air Safaris has decided, in the interests of all concerned, to suspend future operations until the position has been resolved." The "new Government requirements" is a clear reference to the 1960 Act and to the Air Transport Licensing Board's duty to investigate the financial status of companies applying for air service licences. In its recent first annual report (see our issue for Oct. 19) the Board remarked that it was conducting a close scrutiny of balance sheets, profit and loss accounts, and other material.

Air Safaris was incorporated in November, 1959, and, according to recent information given to this journal, has a share capital of £100,000, fully paid up. The directors include Capt. C. M. de Bounevialle (South Africa), A. J. Stocks, W. E. Hamilton and C. V. Ody. Mr. D. Everall joined the board in December, 1960. The fleet comprises five Hermes and nine Vikings.

Altimeters Cleared in Electra Accident

LITIGATION in the aftermath of the American Airlines' Electra crash in the East River at La Guardia came to an end on Oct. 25, in New York, with the conclusion of an eight-week trial in the Brooklyn Supreme Court. Action had been taken by three plaintiffs, two of whom were survivors of the crash and one the widow of a passenger who was killed. The defendants were American Airlines, the Lockheed Aircraft Corp. and the Kollsman Instrument Corp. (makers of the altimeters).

The jury cleared both Lockheed and Kollsman completely, and recorded in a special verdict their opinion that the altimeters were free of any defect. This was in line with the C.A.B. finding, which indicated pilot error as the probable cause of the crash; two surviving crew members, including the co-pilot, claimed that the altimeters mis-indicated by 500 ft.

Damages of $898,000 plus interest were awarded to the three plaintiffs.

Air Traffic Controllers Come of Age

IT would be difficult to put one's finger on the precise date of the birth of present-day A.T.C. methods, but probably the year 1940 is as good as any—in which case 1961 is a very appropriate year for the foundation of the International Federation of Air Traffic Controllers Associations, whose inaugural meeting took place in Amsterdam on Oct. 20.

Originally the group of associations had thought in terms of a European federation rather than an international one, but, as air traffic control today is international rather than regional, the meeting in Amsterdam decided, with undoubted logic, to adopt the IFATCA rather than the EFATCA title. In this they also displayed a mark of confidence in the future of their organization, which, embracing most of the European groups, already extends as far west as Iceland and may expect to reach the American continent within a year or so. The British Guild of Air Traffic Controllers was represented at the Amsterdam meeting by observers and it is thought likely that its accession will follow shortly.

One of the most difficult decisions which the new organization had to take was to determine whether it should function on trade-union or on professional lines. In spite of the fact that nine of its 12 founder members are trade unions, IFATCA has firmly established that it will operate exclusively as an international professional body and that trade-union matters will not come within its purview. This, it would seem likely, will create some strains at rank and file level, but it will, as was intended, have the effect of bringing before the public the controllers' positive contribution to society rather than the mainly defensive attitudes of the trade union. To assist in putting across this image the group decided to launch a three-monthly magazine, to be developed from the already widely known *Der Flugleiter*, edited by Mr. W. Endlich of the German Association.

In addition to adopting the formal constitution of the Federation, the Amsterdam Conference elected Mr. L. Tekstra (Dutch Guild) as president and Mr. H. Thau (German Association) as secretary. As Mr. Tekstra chaired the preliminary meeting of the associations in Frankfurt in 1959 and was responsible for preparing the inaugural meeting, and Mr. Thau had carried out most of the organizational work in the intervening years, there is no doubt that the affairs of IFATCA are in capable and experienced hands.

The meeting was opened at the Pavilioen Vondelpark by Mr. J. W. F. Backer, Director-General of Civil Aviation for the Netherlands, and was attended by representatives of the French ministry, ICAO, Eurocontrol, IFALPA, IATA and the aviation industry.

Not to fret . . .
And not to worry about fretting. We developed our AeroShell Grease 14 to overcome this problem in helicopter rotor heads. It is a grease which lubricates at temperatures down to −65°F., minimises fretting corrosion and prevents corrosion by moisture. It is one of 35 fluids, greases and compounds in the AeroShell range which we have designed for specialised applications in aircraft.
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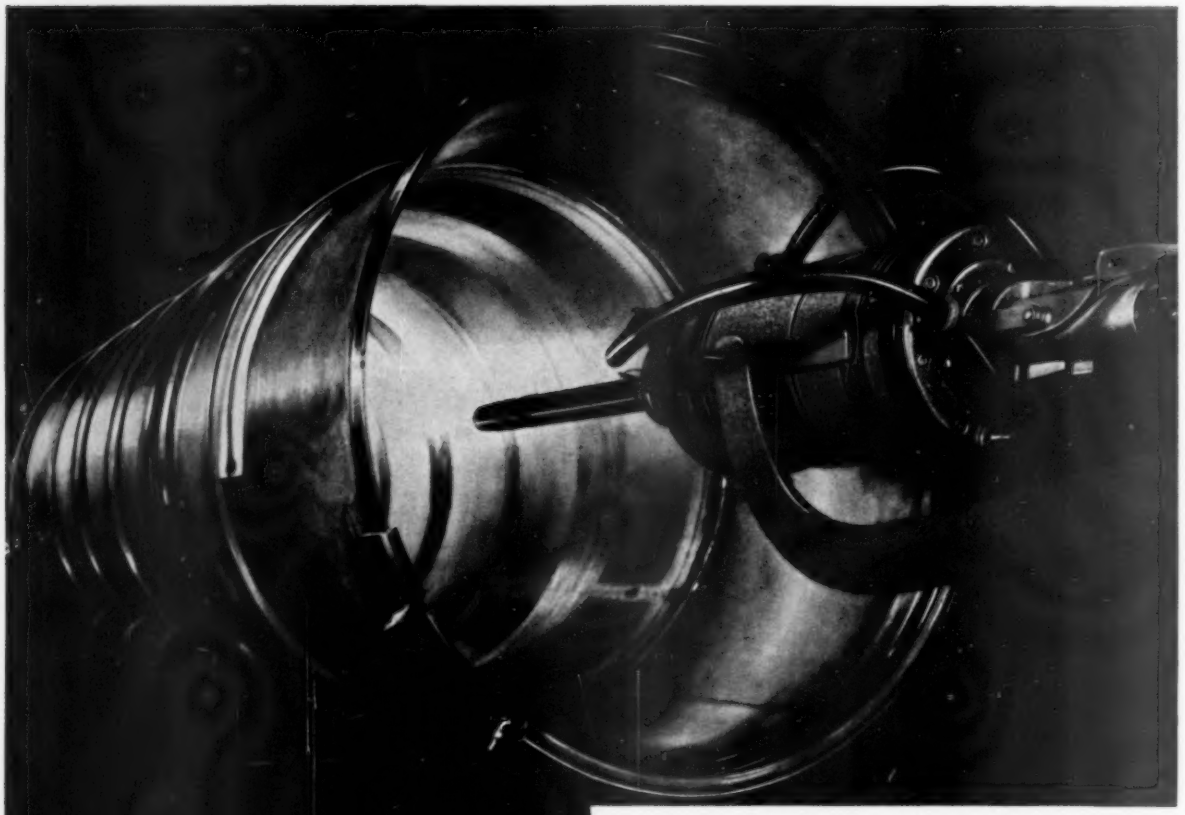
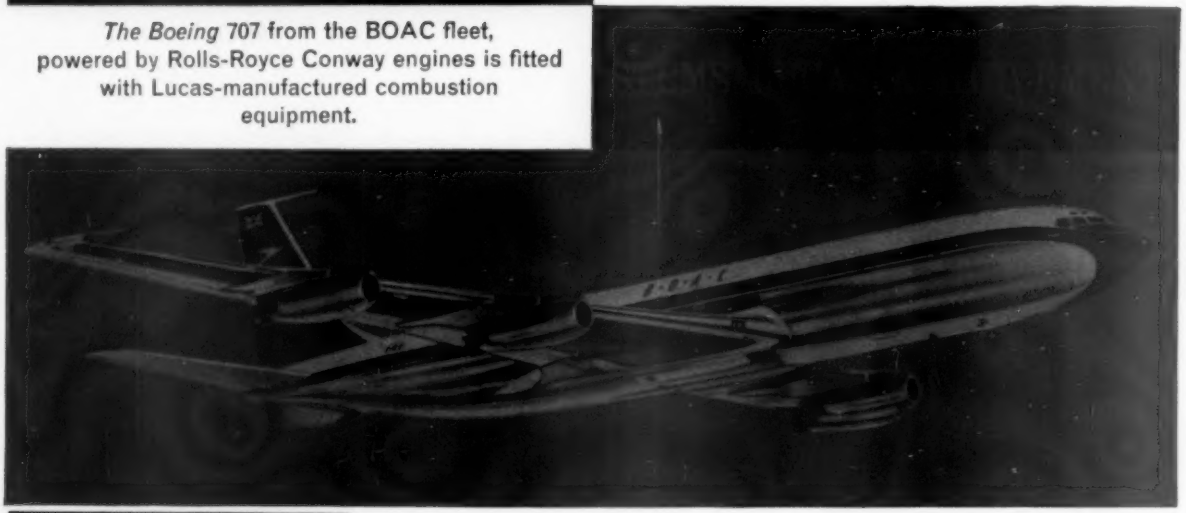
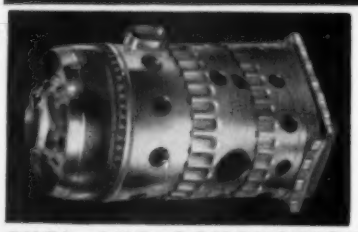


FROM LUCAS CARE–

The fine facilities, like the X-ray laboratory at Burnley, shown here X-raying a section of the Conway Jet Pipe make Lucas leaders with British gas turbine combustion equipment.

The Boeing 707 from the BOAC fleet, powered by Rolls-Royce Conway engines is fitted with Lucas-manufactured combustion equipment.





Conway Combustion Chamber.

Lucas Gas Turbine Equipment Ltd., Birmingham & Burnley.
Lucas-Rotax (Australia) Pty., Ltd., Melbourne & Sydney, Australia.
Lucas-Rotax Limited, Toronto, Montreal & Vancouver, Canada.

LUCAS

FUEL AND COMBUSTION SYSTEMS FOR GAS TURBINE AND RAM JET ENGINES

AIRLINES OF THE WORLD

A B.O.A.C. Comet 4 at Montevideo Airport.

"It will be another few years before the jets have been completely digested. . . . In the meanwhile, we are afflicted with varying degrees of technological and economic indigestion. But, whilst the system may be in some pain, it is essentially healthy and resilient and its troubles are temporary."

Sir William Hildred, Director-General of IATA

THE year 1961 is not likely to be remembered as a very successful or happy one for the World's air transport operators. Nevertheless, it would be quite wrong to give the impression that there has been any kind of down-turn in total traffic. All that has happened is that the growth-rate has slowed down—and this, though influenced largely by temporary political causes, may be a warning that, in the future, the airlines must expect a less spectacular average rate of increase.

Tables on the next page compare second-quarter 1961 traffic results with those for 1960 and annual results for 1960 and 1959 on the North Atlantic and over intra-European routes. In spite of the small growth-rate on the Atlantic—and the reduction in the number of U.S. visitors to Europe which this implies—the European traffic-growth has not been very seriously reduced. Even on the North Atlantic—where reduction in growth has caused so much discomfort among most of the airlines concerned—there were only two months, May and September, in which the passenger totals actually fell below the levels for the same months of 1960.

But the breakdowns do show the way in which far too much capacity is being offered in relation to any possible traffic. Even on the intra-European services there was an increase of 26% in capacity in the second quarter of 1961 when no one could reasonably have expected an increase of more than about 20%. On the North Atlantic the capacity was increased during the same period by the fantastic ratio of 47% to meet a traffic increase which could not, even on the most optimistic forecasts, have been greater than 30%; in the event the increase was less than 5% and the passenger load factor during those three poor months dropped to 50% by comparison with 64% during the same period of 1960.

Needless to say, no one expected the extra seats to be filled on the North Atlantic services. It just happens that the long-haul turbojet is, by the nature of the engineering facts of life, a capacious animal. So the necessary competitive frequencies

Airlines of the World . . . .

TOP TWENTY-FIVE
Scheduled Traffic Only

	Airline	Total traffic tonne-kilometres (thous.)	Airline	Passengers	Airline	Freight tonne-kilometres (thous.)
1.	American	1,112,982	Eastern	8,983,703	Pan American	196,694
2.	Pan American	1,002,718	American	8,591,055	American	185,604
3.	United	998,940	United	8,086,374	United	131,832
4.	T.W.A.	935,165	T.W.A.	5,279,896	Flying Tiger	108,996
5.	Eastern	741,693	B.E.A.	3,813,014	T.W.A.	102,991
6.	Air France	462,347	T.C.A.	3,476,699	K.L.M.	99,628
7.	B.O.A.C.	439,139	Pan American	3,381,150	Air France	76,403
8.	K.L.M.	356,993	Delta	3,374,657	B.O.A.C.	58,560
9.	T.C.A.	339,253	Air France	2,984,290	Northwest	47,421
10.	Northwest	317,873	Braniff	2,281,150	Eastern	45,339
11.	Delta	300,383	Northwest	2,139,547	S.A.S.	41,647
12.	S.A.S.	251,133	S.A.S.	1,880,276	Qantas	38,833
13.	B.E.A.	210,128	National	1,640,427	Seaboard	35,920
14.	National	166,270	Real	1,403,126	Sabena	33,254
15.	Lufthansa	163,699	K.L.M.	1,302,133	Avianca	32,007
16.	Qantas	160,262	Avianca	1,144,887	T.C.A.	30,355
17.	Sabena	157,931	Lufthansa	1,113,085	Lufthansa	29,914
18.	Alitalia	148,575	T.A.A.	1,110,705	Delta	28,416
19.	Swissair	139,947	Alitalia	1,099,668	Swissair	27,391
20.	Braniff	129,277	Swissair	1,032,176	U.A.T.	23,792
21.	Flying Tiger	109,908	Ansett	968,990	B.E.A.	23,516
22.	J.A.L.	97,813	Iberia	951,054	Varig	23,377
23.	T.A.A.	96,515	J.A.L.	761,582	Alitalia	19,865
24.	Ansett	90,234	Philippine	758,040	Indian Airlines	17,873
25.	Avianca	87,333	Varig	746,236	P.I.A.	16,925

The leading 25 IATA carriers listed in order of their relative performances on scheduled services in terms of total revenue tonne-kilometres and freight ton-kilometres performed, and total passengers carried.

were being maintained with aircraft which have twice the capacity of those which were being used on the North Atlantic three years ago. It is likely to be another three years before the traffic can be expected to catch up with even the present levels of offered capacity.

Not unexpectedly, during this era of heavy re-equipment and with the U.S. domestic traffic growth-rate showing only a 2.7% increase in passenger numbers during 1960 in relation to 1959, the overall weight load factor for the World's scheduled airlines in 1960 was, at 55.2%, the lowest for a decade. The figure for 1961 is not likely to be better, but, with a reasonable continued traffic growth and with the airlines' major re-equipment programme largely completed, things should be getting back to normal next year—and to a better than normal level in 1963.

Provisional financial figures for 1960 show that the World's airlines enjoyed an operating margin (revenue over expenditure before deduction of interest, dividends and taxes) of no more than 1%. This may seem to be an incredibly small margin, but, remembering the extent of the payments now being made for new aircraft and other essential equipment in a growing industry, it is remarkable that the figure should even be on the right side of the ledger. The highest annual operating profit ratio for the World's airlines during the past 10 years was 2.6% in 1955; and losses were recorded in 1952, 1953 and 1957.

The airlines are thus in no position yet to be asked to pay for all the facilities which are provided by governments and other authorities—but the industry is now a very big business and cannot, for much longer, expect to enjoy preferential treatment. But whatever the future changes may be, both sides must be made to feel that they are getting a square deal. Clearly there is no justification for making the operators carry the whole cost of all facilities when these are also used for military and other operations, and when, in the case of charges to repay the interest on airport capital expenditure, airlines have had little or no say in the design of the airports concerned—with (to use the words of IATA's director general) their "marble, mosaic, chrome trim, gold door knobs and all."

What is wanted is a rationalized, World-standard approach to the whole problem of "user charges" for airports, and for air-traffic control and navigation-aid facilities.

Two events in 1961 are likely to be the starting points for considerable changes in the pattern of air-cargo development. These events were the introduction into service of two specialized all-freight aircraft and (associated with the appearance of one of these aircraft) the decision to introduce, on the North Atlantic, a simplified special-commodity rating system and standard rates designed to encourage volume shipments. This route has traditionally become that on which new forms of fare-rate structures are tried out—the tourist fare, for instance, in 1952, and the economy fare in 1958—and revised cargo-rating systems, simplified according to area requirements, will certainly, if gradually, be introduced elsewhere. But a tremendous effort in education and demonstration will be necessary if the offered cargo volumes are to keep pace with the increases in aircraft capacity now becoming available.

A feature of the IATA North Atlantic traffic figures for 1960 is the partial collapse of the charter freight business. Whereas the total had been steadily rising since 1953—to 3,590 tonnes in 1959—it dropped in 1960 to 789 tonnes, or little more than the 1957 figure.

The table at the top of this page provides an indirect indication of the relative effort now being put into scheduled air-freight work by operators who, with two exceptions, have been primarily concerned with passenger transport. Of the 25 freight leaders listed, 21 now have all-freight services, though most of these are on a relatively limited scale and fill-up loads continue to provide the bulk of the World's cargo traffic.

After years of traffic growth which has depended primarily on the people who need to travel from place to place, air transport is now depending more and more on customers who must be persuaded to travel—and to travel by air. It is becoming a consumer industry, with all that this means in competitive ingenuity. The change will, in the long run, be a healthy one for air transport.

NORTH ATLANTIC TRAFFIC (IATA MEMBERS)

	1959	1960	Change	2nd Qtr., 1960	2nd Qtr., 1961	Change
Scheduled Operations						
Seats available	2,071,041	2,740,648	+32.3%	675,298	994,989	+47.3%
Passengers	1,367,287	1,760,772	+28.8%	478,751	500,277	+4.5%
Load factor	66.0%	64.2%	−1.8	70.9%	50.3%	−20.6
Cargo (tonnes)	32,799	46,060	+40.4%	10,660	14,415	+35.2%
Charters						
Passengers	172,647	158,978	−7.9%	—	—	—
Cargo (tonnes)	3,590	789	−78.0%	—	—	—

INTRA-EUROPEAN SCHEDULED TRAFFIC (ARB MEMBERS)

	1959	1960	Change	2nd Qtr., 1960	2nd Qtr., 1961	Change
Sector seats available	14,820,100	17,729,000	+19.6%	—	—	—
Sector passengers	8,467,100	10,095,600	+19.2%	—	—	—
Seat-kilometres (thous.)	8,459,500	10,139,900	+19.8%	2,683,000	3,392,900	+26.4%
Passenger-kilometres (thous.)	4,923,600	5,870,600	+19.2%	1,624,000	1,876,800	+15.6%
Load factor	58.2%	57.9%	−0.3	60.5%	55.3%	−5.2
Sector Freight (tonnes)	116,852	137,743	+17.9%	—	—	—
Freight ton-kilometres	71,296,000	81,945,000	+14.9%	—	—	—

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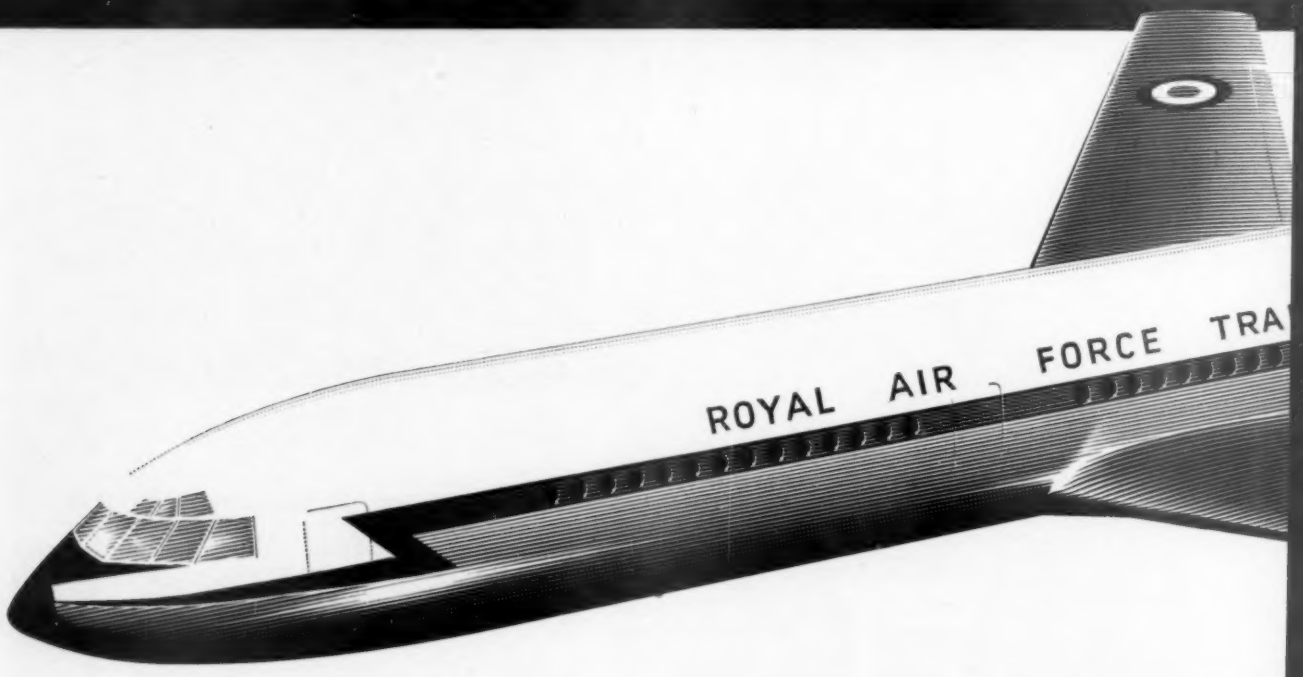

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Airlines of the World . . . .

TRAFFIC STATISTICS for 1960

The tables on this and the following three pages include the latest traffic and other statistics for all the principal airlines in the World. In order to meet the wishes of the majority—and to come into line with ICAO and IATA—the figures are given for the first time this year in metric units. The World's total scheduled traffic for 1960 showed an increase of about 12% in relation to that for 1959.

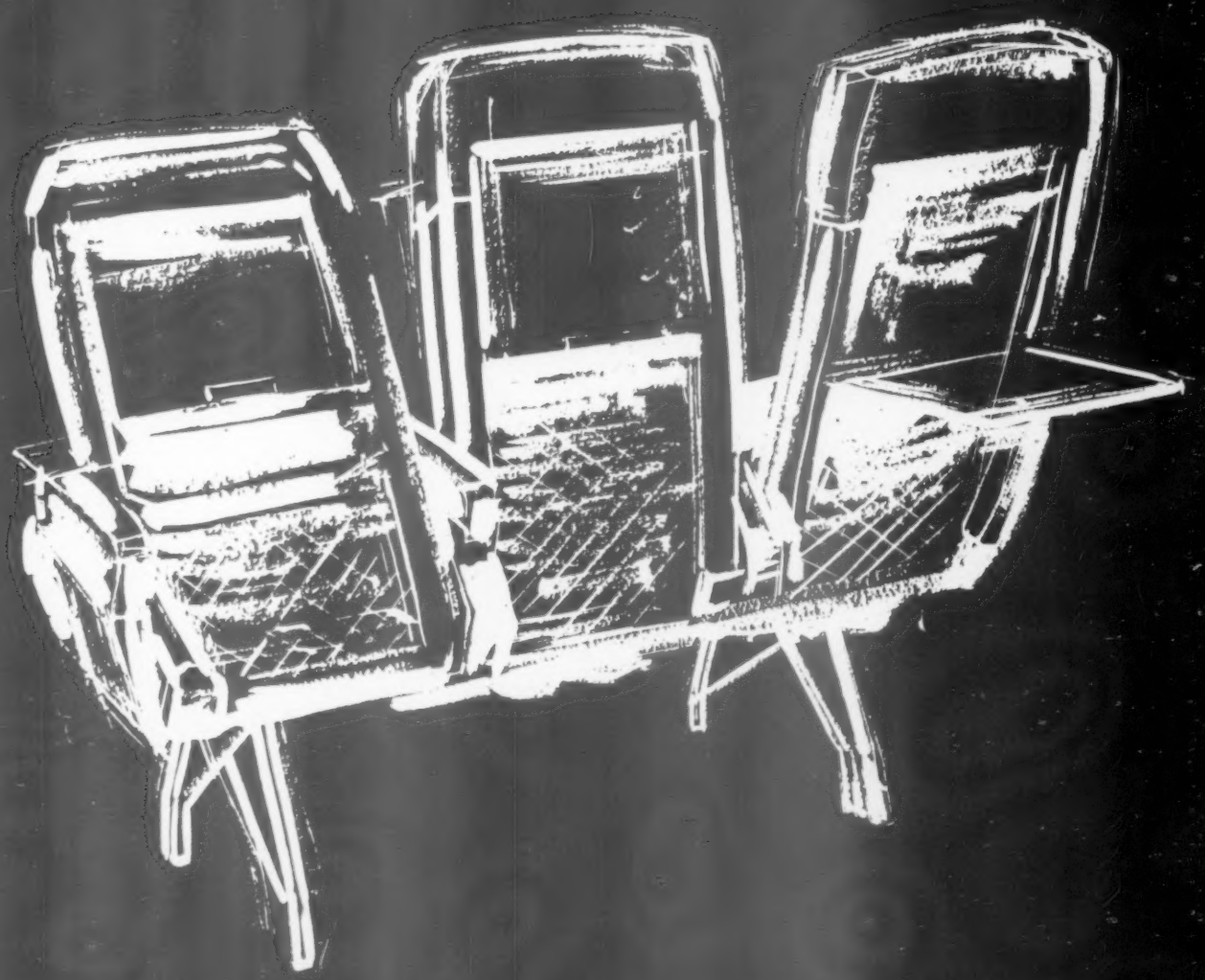
	At June 30, 1961		Revenue kilo-metres flown (thous.)	Revenue passengers carried	Revenue passenger kilo-metres (thous.)	Freight and express tonnes and tonne-km.	Mail tonnes and tonne-km.	Total revenue tonne-km.	Average weight load factor (%)	Tonne-km. produced per employee
	Em-ployees	Undup-licated route kilo-metres								
AFRICA										
ALGERIA										
Air Algérie, Algiers*	—	—	11,313	543,771	467,495	3,398,000 t.-k.	3,515,000 t.-k.	48,987,000	74.8	—
ANGOLA										
D.T.A., Luanda	580	9,355	2,271	44,083	18,882	530,607 t.-k.†	252,658 t.-k.	2,204,349	59.9	—
EGYPT										
United Arab Airways, Cairo*	—	—	7,901	245,919	209,529	2,181,000 t.-k.	285,000 t.-k.	22,599,000	59.5	—
ETHIOPIA										
Ethiopian Airways, Addis Ababa	989	24,699	6,002	104,067	105,148	6,725 tonnes	204 tonnes 492,710 t.-k.	15,770,870	47.0	37,548
KENYA										
Caspair, Nairobi	22	1,094	444	4,930	1,083	24 tonnes	6 tonnes	—	—	—
East African Airways, Nairobi*	1,862	42,088	7,416	149,419	194,466	2,627 tonnes 3,610,147 t.-k.	667 tonnes 1,227,352 t.-k.	21,724,640	62.4	19,797
MOZAMBIQUE										
DETA, Lourenco Marques*	—	—	2,694	34,511	27,089	446,000 t.-k.	166,000 t.-k.	3,196,000	65.1	—
NIGERIA										
Nigeria Airways, Lagos	—	—	3,984	82,429	136,837	2,426,000 t.-k.	1,275,000 t.-k.	15,964,000	70.9	—
RHODESIA AND NYASALAND										
Central African Airways, Salisbury	1,182	18,370	6,168	195,417	149,502	1,880 tonnes 1,424,261 t.-k.	596 tonnes 417,340 t.-k.	14,373,199	65.0	18,715
SOUTH-WEST AFRICA										
Suidwes Lugdiens, Windhoek	—	—	563	3,160	987	9,000 t.-k.	8,000 t.-k.	117,000	68.8	—
SUDAN										
Sudan Airways, Khartoum	731	15,700	3,360	50,559	49,700	804 tonnes 880,000 t.-k.	95 tonnes 139,000 t.-k.	5,540,000	45.0	—
UNION OF SOUTH AFRICA										
South African Airways, Johannesburg*	—	—	14,313	366,438	488,961	9,925,000 t.-k.	4,416,000 t.-k.	56,994,000	62.0	—
AMERICA (NORTH)										
CANADA										
B.C. Airlines, Vancouver	108	2,950	2,987	62,116	9,761	—	—	—	—	—
Canadian Pacific Air Lines, Vancouver	2,750	72,459	20,850	343,832	785,498	2,011 tonnes 8,160,329 t.-k.	886 tonnes 1,932,588 t.-k.	87,179,000*	52.8*	—
Maritime Central Airways, Charlottetown	201	4,720	2,840	62,353	22,600	4,800,000 t.-k.	206,000 t.-k.	5,000,000	—	—
Matane Air Services, Matane	27	700	306	26,255	2,400	23,000 t.-k.†	—	—	—	—
Quebecair, Quebec*	268	5,350	2,993	119,266	50,020	578,000 t.-k.	129,000 t.-k.	5,392,000	57.2	—
Saskatchewan Government Airways, Prince Albert	82	—	2,211	18,622	—	2,921 tonnes	57 tonnes	—	—	—
Trans-Canada Air Lines, Montreal	12,091	63,840	92,499	3,440,303	3,300,127	18,053 tonnes 30,467,058 t.-k.	11,883 tonnes 16,554,211 t.-k.	340,759,477	58.0	52,651
UNITED STATES										
Alaska Airlines, Seattle	477	4,262	6,065	127,621	174,511	11,678 tonnes 6,632,368 t.-k.	1,500 tonnes 1,300,000 t.-k.	23,500,000	63.4	—
Alaska Coastal Airlines, Juneau	144	1,651	1,887	60,494	9,767	673 tonnes 102,411 t.-k.	470 tonnes 81,283 t.-k.	1,179,365	58.8	14,423
Allegheny Airlines, Washington	1,365	3,583	4,074	580,986	211,876	4,834 tonnes 1,286,289 t.-k.	1,150 tonnes 298,678 t.-k.	19,934,963	43.1	33,887
Aloha Airlines, Honolulu	528	665	3,924	400,065	87,418	725 tonnes 154,947 t.-k.	211 tonnes 55,527 t.-k.	7,132,057	52.6	33,377
American Airlines, New York*	24,000	24,600	210,231	8,591,055	10,251,600	185,604,000 t.-k.	34,478,000 t.-k.	1,112,982,000	56.6	82,060
Bonanza Air Lines, Nevada	507	2,153	2,907	261,876	40,485	828 tonnes 116,116 t.-k.	320 tonnes 69,295 t.-k.	4,538,820	41.3	21,818
Braniff International Airways, Dallas*	5,796	24,700	35,582	2,281,150	1,180,934	9,102,000 t.-k.	5,645,000 t.-k.	129,277,000	46.0	48,500
Chicago Helicopter Airways, Chicago*	209	221	1,798	309,107	8,375	—	—	747,000	40.2	8,850
Continental Airlines, Denver	2,729	—	38,800	1,336,794	1,430,000	6,800 tonnes 9,550,000 t.-k.	3,440 tonnes 3,449,000 t.-k.	—	—	—

* Traffic statistics for scheduled services only. † Including excess baggage.

Airlines of the World . . . .

	At June 30, 1961		Revenue kilo-metres flown (thous.)	Revenue passengers carried	Revenue passenger kilo-metres (thous.)	Freight and express tonnes and tonne-km.	Mail tonnes and tonne-km.	Total revenue tonne-km.	Average weight load factor (%)	Tonne-km. produced per employee
	Em-ployees	Unduplicated route kilo-metres								
U.S.A. (contd.)										
Delta Air Lines, Atlanta*	8,290	22,727	78,172	3,374,657	3,010,014	28,416,000 t.-k.	8,705,000 t.-k.	300,383,000	49.7	73,000
Eastern Air Lines, New York*	17,572	30,000	204,305	8,983,703	7,667,272	45,339,000 t.-k.	23,733,000 t.-k.	741,693,000	43.7	98,000
Flying Tiger Line, Burbank, Cal.	—	—	16,166	42,707	243,210	39,997 tonnes 170,235,065 t.-k.	598 tonnes 1,049,361 t.-k.	195,605,390	73.3	—
Frontier Airlines, Denver	1,098	10,050	15,050	338,189	145,000	2,970 tonnes† 1,460,000 t.-k.	1,095 tonnes 485,000 t.-k.	14,400,000	43.1	30,000
Hawaiian Airlines, Honolulu	791	695	6,825	555,940	—	11,771 tonnes† 4,717,301 t.-k.	333 tonnes 621,286 t.-k.	21,328,928	59.6	45,247
Lake Central Airlines, Indianapolis	946	6,935	5,920	226,172	57,500	362,000 t.-k.†	104,000 t.-k.	5,430,000	—	—
Los Angeles Airways, Los Angeles	135	—	1,025	40,438	2,240	—	2,440 tonnes 85,300 t.-k.	315,000	64.4	3,690
Mackey Airlines, Fort Lauderdale, Fla.	133	1,875	1,463	128,176	42,852	500 tonnes† 109,457 t.-k.	—	4,645,481	47.6	38,700
Mohawk Airlines, Utica, N.Y.	1,176	—	—	107,421	1,477	642,337 t.-k.	213,997 t.-k.	1,589,692	54.8	—
National Airlines, Miami*	3,828	10,500	40,390	1,640,427	1,674,480	13,045,000 t.-k.	5,806,000 t.-k.	166,270,000	42.6	—
New York Airways, New York*	—	—	747	142,021	4,696	28,000 t.-k.	28,000 t.-k.	463,000	52.6	—
North Central Airlines, Minneapolis	2,150	11,400	23,800	1,035,076	—	1,530,000 t.-k.	720,000 t.-k.	—	—	—
Northeast Airlines, Boston	2,990	6,012	30,676	1,528,577	943,952	5,918,992 t.-k.†	2,586,677	98,182,000	45.0	—
Northwest Airlines, St. Paul.*	5,345	30,400	75,107	2,139,547	2,661,728	47,421,000 t.-k.	35,659,000 t.-k.	317,873,000	51.1	107,500
Ozark Air Lines, St. Louis	1,086	12,000	14,600	572,348	161,028	3,840 tonnes 981,000 t.-k.	1,055 tonnes 305,000 t.-k.	15,200,000	44.4	31,800
Pacific Northern Airlines, Seattle	633	8,000	7,100	134,567	187,500	4,700 tonnes 6,200,000 t.-k.	2,470 tonnes† 2,310,000 t.-k.	26,700,000	61.9	43,700
Pan-American Grace Airways, New York	1,190	6,819	8,172	124,594	319,167	9,760,000 t.-k.	2,192,000 t.-k.	42,613,000	57.8	—
Pan American World Airways, New York*	22,648	114,700	141,651	3,381,150	7,777,179	196,694,000 t.-k.	87,783,000 t.-k.	1,002,718,000	58.9	73,200
Piedmont Airlines, Winston-Salem, N.C.	1,082	6,270	11,700	500,564	156,000	2,160 tonnes† 715,000 t.-k.	750 tonnes 244,000 t.-k.	14,400,000	48.7	30,000
Seaboard World Airlines, New York	1,003	9,979	10,574	27,393	170	59,616,247 t.-k.	13,674,484 t.-k.	88,940,946	79.9	97,737
Southern Airways, Atlanta	980	754	9,122	260,493	74,898	1,617 tonnes 463,952 t.-k.	965 tonnes 287,739 t.-k.	8,380,259	33.6	—
Trans World Airlines, New York*	20,671	80,000	174,057	5,279,896	8,835,303	102,991,000 t.-k.	53,360,000 t.-k.	935,165,000	53.5	85,740
United Airlines, Chicago	30,000	28,800	194,675	8,111,000	9,323,644	145,574,000 t.-k.	63,088,000 t.-k.	1,106,700,000	57.2	75,300*
West Coast Airlines, Seattle	766	5,200	11,000	389,077	150,000	1,250 tonnes† 493,000 t.-k.	670 tonnes 254,000 t.-k.	13,680,000	44.8	17,700
Western Alaska Airlines, Dillingham	16	763	489	8,677	675	17,800 t.-k.	12,100 t.-k.	89,500	66.0	—
Wien Alaska Airlines, Fairbanks	310	4,661	3,996	47,077	20,789	1,796,000 t.-k.	797,000 t.-k.	4,479,280	52.7	18,390
AMERICA (CENTRAL AND SOUTH)										
ARGENTINA										
Aerolineas Argentinas, Buenos Aires*	—	—	20,654	551,569	591,929	5,988,000 t.-k.	1,706,000 t.-k.	63,152,000	66.7	—
Int Airlines, Buenos Aires*	—	—	874	2,784	21,342	1,351,000 t.-k.	—	3,417,000	60.4	—
BOLIVIA										
Lloyd Aero Boliviano, Cochabamba	1,000	19,792	3,792	182,861	46,653	17,784 tonnes† 5,760,893 t.-k.	61 tonnes 17,126 t.-k.	9,567,717	75.3	9,568
BRAZIL										
Cruzeiro do Sul, Rio de Janeiro*	—	—	18,066	494,570	351,542	11,682,000 t.-k.	571,000 t.-k.	39,197,000	65.9	—
Panair do Brasil, Rio de Janeiro*	—	—	16,723	287,538	460,832	10,486,000 t.-k.	2,470,000 t.-k.	53,839,000	50.3	—
REAL-Aerovias-Nacional, Sao Paulo	—	—	34,622	1,403,126	779,847	16,606,000 t.-k.	1,055,000 t.-k.	79,586,000	64.0	—
Varig, Porto Alegre	5,508	—	23,884	746,236	603,370	23,377,000 t.-k.	1,041,000 t.-k.	77,022,000	64.6	—
CHILE										
LAN-Chile, Santiago	1,950	25,044	11,351	393,453	403,268	6,380 tonnes	268 tonnes	44,766,861	71.4*	24,982
COLOMBIA										
Avianca, Bogota*	—	—	26,071	1,144,887	590,412	32,007,000 t.-k.	807,000 t.-k.	87,333,000	62.9	—
CUBA										
Cubana, Havana*	—	—	7,008	243,250	204,879	2,001,000 t.-k.	245,000 t.-k.	23,155,000	45.9	—
MEXICO										
Aeronaves de Mexico, Mexico City*	2,500	—	12,098	479,355	418,776	4,468,000 t.-k.	407,000 t.-k.	43,497,000	70.4	—
Mexicana, Mexico City	3,333	12,112	18,635	576,006	626,136	16,411 tonnes† 15,730,421 t.-k.	820 tonnes 829,936 t.-k.	70,063,078	55.0	21,021
Trans Mar de Cortes, La Paz	141	2,274	586	21,024	8,611	323 tonnes	32 tonnes	20,810,969	60.0	—
PERU										
Cia de Aviation "Faucett," Lima	736	8,075	5,600	193,489	102,500	19,262 tonnes	513 tonnes	—	—	—

* Traffic statistics for scheduled services only. † Including excess baggage.



Gold rush '61

From Rome to the gold-rich Rand. Alitalia's long-range DC-8's, powered by Rolls-Royce Conway engines, cover in hours distances that took the overland trekkers months. Pre-war pioneers of 'bush pilot' operations in Africa, Alitalia now operate in 41 countries, providing a network of 93,000 route miles reaching almost around the world. At both ends of Alitalia's trans-African service it is AIR BP who provide the fuelling service: at Fiumicino by the latest highly efficient hydrant system, at Johannesburg by tankers capable of delivering thousands of gallons in a matter of minutes.

Fast flying ALITALIA... fast fuelling AIR BP

Airlines of the World . . . .

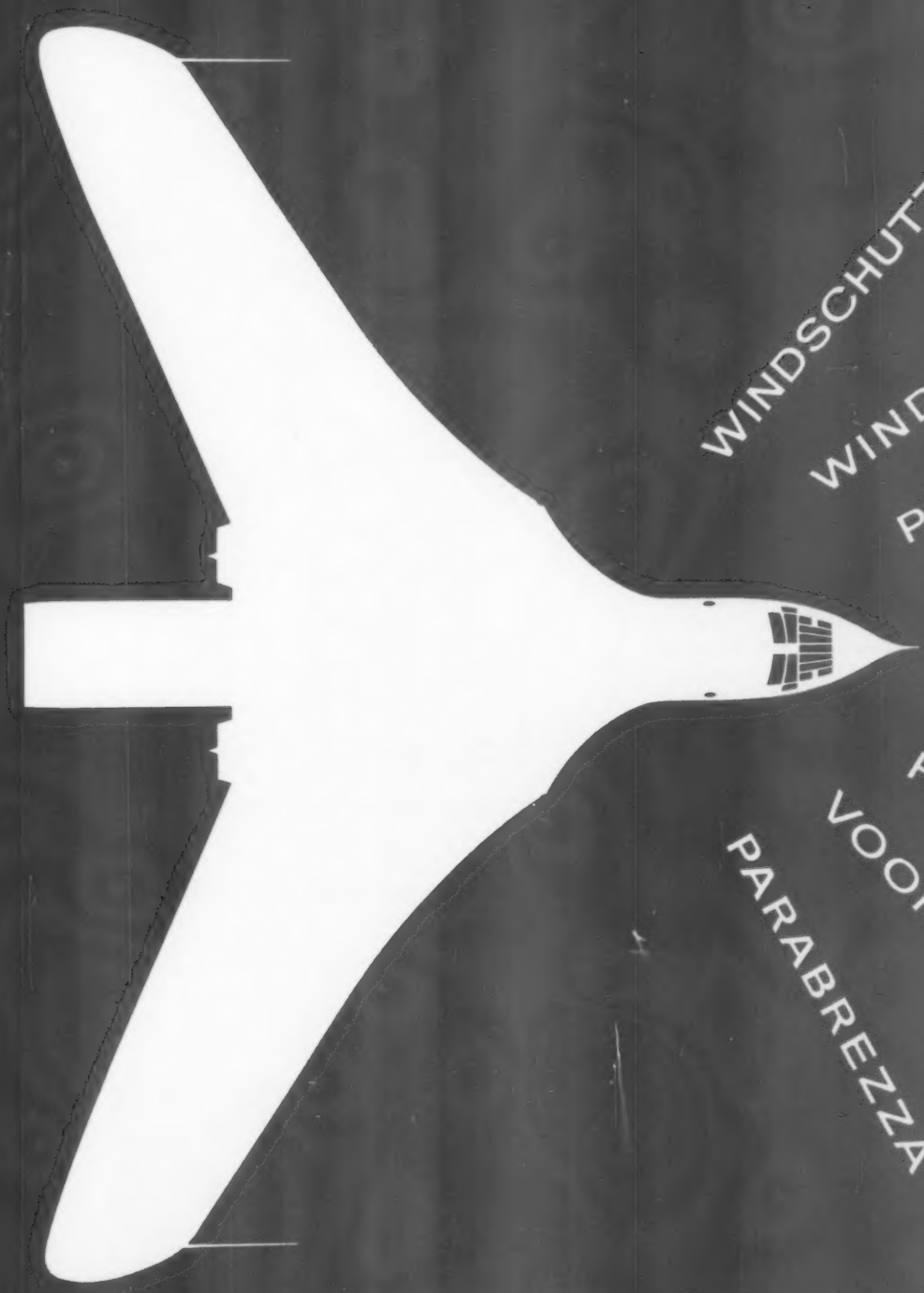
	At June 30, 1961		Revenue kilo-metres flown (thous.)	Revenue passengers carried	Revenue passenger kilo-metres (thous.)	Freight and express tonnes and tonne-km.	Mail tonnes and tonne-km.	Total revenue tonne-km.	Average weight load factor (%)	Tonne-km. produced per employee
	Em-ployees	Unduplicated route kilo-metres								
AMERICA (Central and South) (Contd.)										
URUGUAY										
PLUNA, Montevideo	825	9,904	2,919	211,671	71,820	831 tonnes† 376,646 t.-k.	13 tonnes 6,663 t.-k.	6,551,154	72.3	8,252
VENEZUELA										
Avensa, Caracas	1,280	11,703	10,569	462,391	190,956	18,773,242 t.-k.†	—	46,302,821	38.6	—
WEST INDIES										
British West Indian Airways	900	14,433	5,611	225,481	181,561	1,779 tonnes 1,304,000 t.-k.	649 tonnes 709,000 t.-k.	19,370,000	60.0	35,460
ASIA										
BORNEO										
Borneo Airways, Labuan	140	2,171	750	43,430	5,758	272 tonnes 37,264 t.-k.	117 tonnes 18,017 t.-k.	468,517	59.0	—
CEYLON										
Air Ceylon, Colombo*	—	—	2,264	77,347	47,574	1,536,000 t.-k.	392,000 t.-k.	5,485,000	39.8	—
FORMOSA										
Civil Air Transport, Taipei*	—	—	2,573	109,746	63,882	1,419,000 t.-k.	373,000 t.-k.	7,549,000	48.0	—
HONG KONG										
Cathay Pacific Airways	436	31,830	5,793	98,213	193,792	1,514 tonnes 3,586,000 t.-k.	Included in freight	21,043,000	46.0	48,264
INDIA										
Air-India International, Bombay* ..	—	—	12,081	109,962	520,904	15,909,000 t.-k.	4,709,000 t.-k.	68,268,000	50.0	—
Indian Airlines Corporation, Delhi* ..	—	—	29,246	745,288	591,516	17,873,000 t.-k.	6,058,000 t.-k.	77,355,000	73.0	—
INDONESIA										
Garuda Indonesian Airways, Djakarta* ..	—	—	9,403	373,646	258,987	2,871,000 t.-k.	1,198,000 t.-k.	23,764,000	84.7	—
IRAQ										
Iraqi Airways, Baghdad*	456	—	2,391	80,215	52,000	886,000 t.-k.	161,000 t.-k.	5,105,000	34.0	—
ISRAEL										
" Arkia " Israel Inland Airlines, Tel-Aviv*	70	438	1,250	94,718	26,027	37,920 t.-k.	5,880 t.-k.	2,135,000	72.0	—
El Al Israel Airlines, Tel-Aviv*	1,934	34,600	7,531	111,440	413,451	8,404,000 t.-k.	1,017,000 t.-k.	47,318,000	63.3	50,587
JAPAN										
Japan Air Lines, Tokyo	3,620	58,072	20,467	761,582	873,338	5,805 tonnes 15,369,000 t.-k.	2,101 tonnes 7,264,000 t.-k.	97,813,000	64.0	—
LEBANON										
Air Liban, Beirut*	—	—	3,675	74,256	94,340	1,816,000 t.-k.	78,000 t.-k.	10,670,000	45.9	—
Middle East Airlines, Beirut	2,058	81,534	8,277	156,837	137,777	3,282 tonnes	292 tonnes	21,844,400	51.0	41,480
Trans-Mediterranean Airways, Beirut ..	450	—	3,702	26,344	36,176	—	—	16,036,000	50.0	66,150
PAKISTAN										
Pakistan International Airlines, Karachi*	5,732	20,815	9,625	259,621	344,409	16,925,000 t.-k.	1,311,000 t.-k.	49,048,000	59.4	—
PERSIA										
Iranian Airways, Teheran*	—	—	3,292	113,551	59,093	2,936,000 t.-k.	102,000 t.-k.	8,671,000	52.9	—
PHILIPPINES										
Philippine Air Lines, Manila*	—	—	13,365	758,040	285,973	3,145,000 t.-k.	236,000 t.-k.	23,914,000	68.4	—
PORTUGUESE INDIA										
T.A.I.P., Goa	—	—	2,771	9,728	—	49 tonnes	56 tonnes	—	—	—
SINGAPORE										
Malayan Airways, Singapore*	1,405	7,878	4,807	177,725	81,627	1,865,000 t.-k.	392,000 t.-k.	8,845,000	54.1	11,869
THAILAND										
Thai Airways, Bangkok	459	—	1,740	58,126	29,235	618 tonnes 291,204 t.-k.	51 tonnes 32,007 t.-k.	2,547,276	57.7	—
VIETNAM										
Air Vietnam, Saigon*	—	—	1,751	72,277	38,471	523,000 t.-k.	119,000 t.-k.	3,667,000	60.0	—
AUSTRALASIA & OCEANIA										
AUSTRALIA										
Airlines of New South Wales, Sydney ..	212	13,210	5,820	274,469	103,300	1,320,000 t.-k.	119,000 t.-k.	11,815,000	57.5	95,300
Airlines of South Australia, Adelaide‡ ..	65	3,260	1,875	130,201	37,700	1,400 tonnes 424,000 t.-k.	144 tonnes 31,000 t.-k.	6,630,000*	59.7	—
Ansett/A.N.A., Melbourne*	3,756	29,815	25,381	968,990	768,923	2,136,000 t.-k.	23,034,000 t.-k.	90,234,000	63.2	37,600
East-West Airlines, Tamworth, N.S.W.	165	8,100	2,645	120,318	43,616	817 tonnes 309,840 t.-k.	116 tonnes 44,420 t.-k.	4,715,843	51.3	—
MacRobertson Miller Airlines, Perth ..	415	28,300	4,155	53,296	48,123	3,018 tonnes 2,830,480 t.-k.	154 tonnes 147,558 t.-k.	7,750,300	66.7	28,005
Qantas Empire Airways, Sydney ..	6,733	111,294	27,522	209,169	1,135,376	40,172,108 t.-k.	15,300,677 t.-k.	162,578,418	54.8	46,100
Queensland Airlines, Brisbane	45	6,960	1,650	49,350	16,500	—	—	1,148,600	56.0	—
Trans-Australia Airlines, Melbourne* ..	4,300	—	26,749	1,110,705	876,700	16,152,000 t.-k.	2,151,000 t.-k.	96,515,000	64.8	34,700
FIJI										
Fiji Airways, Suva	71	1,918	607	28,597	4,007	25,000 t.-k.	8,900 t.-k.	345,000	54.1	8,986
NEW CALEDONIA										
" Transpac," Noumea	25	1,940	—	—	2,178	27,066 t.-k.	Included in freight total	189,835	84.0	9,351

* Traffic statistics for scheduled services only. † Including excess baggage. ‡ For year ended June 30, 1961.

Airlines of the World . . . .

	At June 30, 1961		Revenue kilo-metres flown (thous.)	Revenue passengers carried	Revenue passenger kilo-metres (thous.)	Freight and express tonnes and tonne-km.	Mail tonnes and tonne-km.	Total revenue tonne-km.	Average weight load factor (%)	Tonne-km. produced per employee
	Em-ployees	Undup-licated route kilo-metres								
AUSTRALASIA (Contd.)										
NEW ZEALAND										
New Zealand National Airways, Welling-ton	2,143	5,560	12,400	699,091	289,000	5,393,000 t.-k.	490,000 t.-k.	28,500,000	74.8	17,800
Tasman Empire Airways, Auckland* ..	990	18,658	4,383	96,549	211,086	1,803,000 t.-k.	1,146,000 t.-k.	22,447,245	60.9	46,578
EUROPE										
AUSTRIA										
Austrian Airlines, Vienna	700	14,000	3,107	118,551	—	700 tonnes 426,107 t.-k.	282 tonnes 184,709 t.-k.	6,691,916	41.4	—
BELGIUM										
Sabena, Brussels*	10,985	238,882	32,640	742,332	1,264,094	33,254,000 t.-k.	5,459,000 t.-k.	157,931,000	65.6	27,340
CZECHOSLOVAKIA										
C.S.A., Prague*	—	—	12,345	680,816	340,478	4,196,000 t.-k.	2,296,000 t.-k.	36,742,000	65.9	—
FINLAND										
Finnair, Helsinki*	—	—	10,306	496,344	216,707	2,939,000 t.-k.	727,000 t.-k.	22,973,000	46.9	—
FRANCE										
Air France, Paris	24,885	320,000	88,650	3,055,512	4,048,900	60,540 tonnes† 91,811,000 t.-k.†	20,315 tonnes	474,596,000	66.0	34,500
Air Inter, Paris‡	27	7,910	1,412	64,005	31,733	369 tonnes	—	—	51.5	—
T.A.I., Paris	1,893	102,000	11,887	86,550	403,546	10,963,366 t.-k.	2,955,369 t.-k.	50,582,790	61.6	—
U.A.T., Paris*	—	—	15,395	201,103	468,323	23,792,000 t.-k.	2,722,000 t.-k.	68,580,000	68.2	—
GERMANY (WEST)										
Lufthansa, Cologne	11,170	98,122	35,100	1,237,629	1,393,700	14,855 tonnes† 31,700,000 t.-k.	4,132 tonnes 9,600,000 t.-k.	175,400,000	58.0	32,000
GREECE										
Olympic Airways, Athens*	1,840	17,067	9,094	461,466	289,130	4,196,000 t.-k.	885,000 t.-k.	29,974,000	52.6	—
ICELAND										
Icelandair, Reykjavik	290	—	2,311	70,232	52,322	802,000 t.-k.†	150,000 t.-k.	5,620,000	62.2	—
Icelandic Airlines, Reykjavik	320	19,795	4,609	10,019	205,499	831,855 t.-k.	111,604 t.-k.	19,415,932	65.3	—
IRELAND										
Aer Lingus, Dublin*	—	—	8,235	642,122	260,949	2,923,000 t.-k.	439,000 t.-k.	24,740,000	64.8	—
Aerlinte, Dublin*	—	—	2,405	29,100	142,824	880,000 t.-k.	202,000 t.-k.	13,524,000	56.0	—
ITALY										
Alitalia-LAI, Rome*	—	—	37,074	1,099,668	1,338,813	19,865,000 t.-k.	6,645,000 t.-k.	148,575,000	55.6	—
NETHERLANDS										
K.L.M., The Hague	19,041	278,600	81,200	1,361,000	2,695,900	38,305 tonnes 105,200,000 t.-k.	3,774 tonnes 13,700,000 t.-k.	366,300,000	59.5	34,500
NORWAY										
Wideröe, Oslo	320	—	—	17,238	—	27 tonnes	114 tonnes	399,894	65.0	—
POLAND										
LOT, Warsaw*	1,531	14,352	5,896	166,048	100,821	736,000 t.-k.	681,000 t.-k.	10,003,000	67.0	—
PORTUGAL										
T.A.P., Lisbon	1,504	25,311	5,401	98,304	195,581	620 tonnes† 1,336,570 t.-k.	413 tonnes 1,782,145 t.-k.	21,945,350	54.9	30,904
SCANDINAVIA										
S.A.S., Stockholm*	—	—	61,181	1,880,276	2,198,674	41,647,000 t.-k.	13,131,000 t.-k.	251,133	54.4	—
SPAIN										
Aviaco, Madrid	510	—	4,175	204,981	87,085	577,561 t.-k.	591,796 t.-k.	9,057,665	61.7	—
Iberia, Madrid	—	—	21,865	951,054	694,708	4,200,000 t.-k.	2,201,000 t.-k.	68,813,000	58.6	—
SWEDEN										
Linjeflyg, Bromma	390	5,926	4,403	212,104	60,425	2,247,211 t.-k.	266,422 t.-k.	7,418,255	48.0	39,630
SWITZERLAND										
Swissair, Zurich	7,483	110,882	32,594	1,303,225	1,151,945	12,708 tonnes 28,169,339 t.-k.	3,129 tonnes 6,951,044 t.-k.	141,916,961	58.6	35,372
UNITED KINGDOM										
British Aviation Services, London§ ..	1,104	20,574	8,030	574,736	139,126	124,843 tonnes 10,626,334 t.-k.	—	22,562,945	72.9*	28,026
British European Airways, London ..	14,409	71,727	64,037	3,865,840	2,176,102	37,624 tonnes 24,161,528 t.-k.	7,820 tonnes 6,072,171 t.-k.	220,267,753	66.2	25,720
British Overseas Airways, London* ..	21,301	124,068	86,269	740,941	3,765,058	9,531 tonnes† 62,800,000 t.-k.	4,826 tonnes 41,356,000 t.-k.	439,139,000	56.9	37,852
British United Airways, London‖ ..	—	69,100	5,480	43,249	138,843	8,262,000 t.-k.	29,000 t.-k.	18,783,000	56.5	—
Cambrian Airways, Cardiff*	65	2,457	1,011	59,068	18,869	26,400 t.-k.	—	1,613,052	57.9	42,860
Channel Air Bridge	230	530	2,583	155,870	23,599	42,708 tonnes 6,210,214 t.-k.	—	12,176,954	67.0	90,680
Cunard Eagle Airways, London* ..	1,087	12,602	908	41,194	36,039	—	—	3,247,000	52.7	—
Derby Airways, London	170	—	1,920	104,060	47,540	246 tonnes 238,000 t.-k.	—	3,338,000	56.0	37,650
Jersey Airlines, Jersey	450	2,300	2,480	207,562	23,999	140 tonnes 25,600 t.-k.	—	3,060,000	58.0	—
Skyways, London*	—	—	370	6,390	13,257	124,000 t.-k.	3,000 t.-k.	1,179,000	53.2	—

* Traffic statistics for scheduled services only. † Including excess baggage. ‡ For year ended June 30, 1961. § Including Silver City Airways. ‖ IATA figures for scheduled service traffic only, excluding Channel Air Bridge (separate entry in table) and Straits Air Freight Express, New Zealand.



WINDSCHUTZSCHEIBEN

WINDSCREENS

PARABRISAS

TUULILASIT

VINDRUTOR

PARE-BRISE

VOORRUITEN

PARABREZZA

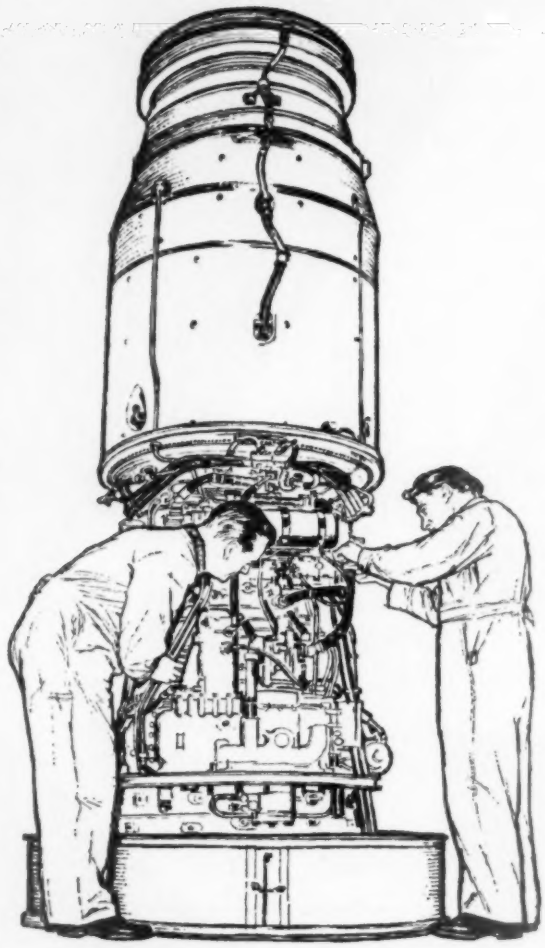
by "TripleX"

1 ALBEMARLE ST., LONDON W.1.

BS

AERO POWER

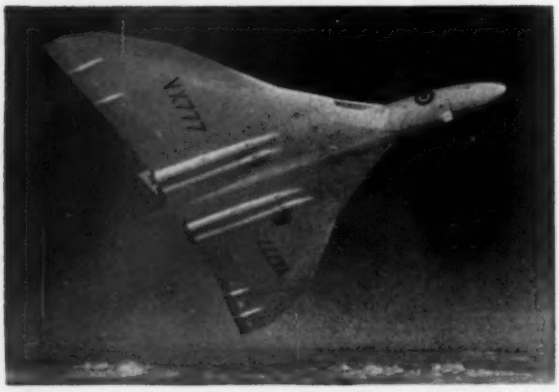
Olympus—for supersonic economy at Mach 2 plus



An advanced version of the Bristol Siddeley Olympus is now under intensive development for British Aircraft Corporation's TSR 2. It will give this unique tactical/support reconnaissance aircraft an exceptional performance at speeds up to Mach 2 and over.

THE RIGHT QUALITIES . . .

The Olympus has the ideal thermodynamic cycle for the economic propulsion of a supersonic aircraft at Mach 2 plus and embodies all the qualities essential for such an application: high power at high altitude; extremely low fuel consumption; great operational flexibility; a long overhaul life; a very high thrust/weight ratio; and excellent handling qualities.

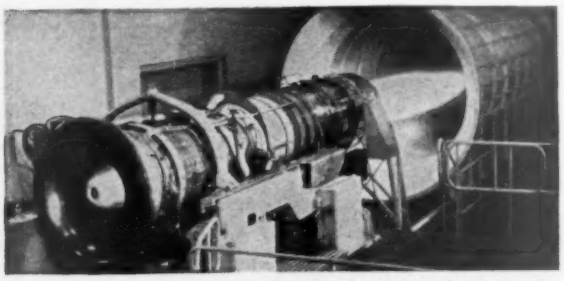


Avro Vulcan Mk 2 V-bomber

. . . PROVED IN SERVICE

The Olympus has proved itself in several years' service, as the powerplant of the Avro Vulcan V-bomber, to be one of the most successful turbojets ever built. Maintenance is exceptionally low—last year, for example, on a 26,000-mile round-the-world tour, the maintenance required was negligible.

The truly astonishing built-in potential of the Olympus has been confirmed by the threefold increase in power from the 11,000-lb thrust dry of the original production engine, to the 33,000-lb thrust with reheat of the latest version.



Olympus under test with reheat in operation

SUITABILITY FOR SUPERSONIC AIRLINERS

Already selected for the RAF's most up-to-date supersonic aircraft, the Olympus will clearly require relatively minor changes to adapt it to the requirements of a supersonic airliner in the same speed category.

BRISTOL SIDDELEY ENGINES LIMITED

TURBOJETS–TURBOFANS–TURBOPROPS–RAMJETS–ROCKET ENGINES–MARINE AND INDUSTRIAL GAS TURBINES
MARINE, RAIL AND INDUSTRIAL DIESEL ENGINES–PISTON ENGINES–PRECISION ENGINEERING PRODUCTS

GUIDE TO THE WORLD'S AIRLINES

These information summaries cover all the World's operators of scheduled services and are arranged alphabetically by continent, country and airline name. The 300 entries include brief background details and listings of the aircraft fleets (both in service and on order) and of the executive managements.

AFRICA

ALGERIA

Air Algérie.—46 Boulevard Saint-Saëns, Algiers; and 6 rue Auber, Paris 9e.

Cie Générale de Transports Aériens Air Algérie was formed from a merger, in May, 1953, of Air Transport (1946) and the original Air Algérie (1947). Air Algérie is the air transport affiliate of Cie. Générale Transatlantique and Cie. de Navigation Mixte.

AIRCRAFT (Sept., 1961): 6 Caravelle, 2 L-749A, 10 DC-4, 3 DC-3, 3 Noratlas.

MANAGEMENT: President and director-general, M. J. Richard Deshais; permanent counsellor, Col. J. Souffiet; joint director-general, Col. H. Alias.

ANGOLA

Direcção de Exploração dos Transportes Aéreos (D.T.A.).—Union Building, Avenue Paulo Dias de Novais 79/81, P.O. Box 79, Luanda.

Formed in 1938, D.T.A. is Government controlled. Operations started in 1940. Domestic services are flown within Angola and international services to Leopoldville, Pointe Noire and Elisabethville.

AIRCRAFT: 7 DC-3, 4 Beech D-18S and 1 D.H. Rapide; on order, 2 F-27.

MANAGEMENT: Director, Lt.-Col. Jacinto da Silva Medina.

CONGO REPUBLIC

Air Brousse.—12 Avenue des Aviateurs (B.P.2438), Leopoldville.

Operates local services from Leopoldville and Luluabourg. With the formation of Air Congo (see below) it seems likely that Air Brousse will be absorbed.

AIRCRAFT: 4 D.H. Rapide, 4 Piper Pacer.

Air Congo.—Leopoldville.

With technical assistance from Sabena, Air Congo has been set up as the Republic's "chosen instrument" airline for domestic and international services. Capital is being subscribed by the Congo Government (65%), Sabena (30%), Sobelair/Air Brousse (5%).

AIRCRAFT: DC-4, DC-3, Convairliner (ex-Sabena).

MANAGEMENT: President of the Council of Administration, M. Hubert Sangara; vice-president, M. Gilbert Périer; general manager, M. Fernand Essandja.

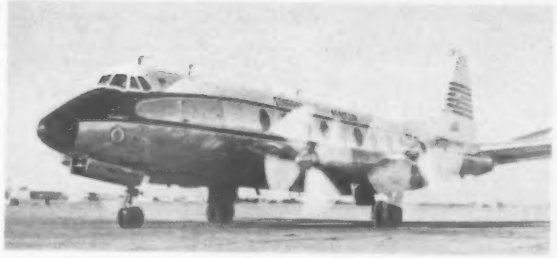
Sobelair (see under Europe, Belgium).

EGYPT

United Arab Airlines S.A.A.—Almaza Airport, Heliopolis.

Formed as Misr Airwork in May, 1932, the name Misrair was adopted in 1949 when it was wholly owned by Egyptian interests. The name United Arab Airlines was adopted when Syrian Airways amalgamated with Misrair about a year ago. U.A.A. operates services from Cairo to Rome and then London via Zurich, Geneva or Frankfurt; to Moscow via Prague; to Pakistan and India; and to points in Africa.

AIRCRAFT: 5 Comet 4C, 6 Viscount 700, 3 DC-6, 4 DC-3.



MANAGEMENT: Chairman, Air Marshal Mohamed Sidky Mahmoud; managing director, A.V.M. Hassan Mahmoud; general manager, Air Cdre. Mahmoud Sidky El-Miligi.

ETHIOPIA

Ethiopian Air Lines, Inc.—P.O.B. 1755, Addis Ababa.

Owned by the Ethiopian Government and managed by Trans World Airlines under contract, this company was formed in 1946. Ethiopian flies over an internal network and to external points including Frankfurt, Khartoum, Port Sudan, Aden, Djibouti, Athens, Cairo, Nairobi, Lagos, Accra and Monrovia.

AIRCRAFT (Sept. 23, 1961): 3 DC-6B, 6 DC-3, 2 Convair 240, 5 Bell 47; on order 2 Boeing 720B.

MANAGEMENT: President, H. E. Balambaras Mahteme Selassie Wolde Maskal; general manager, V. H. Harrell, Jr.; flight ops. manager, G. K. Hills; general sales manager, R. E. Chase, Jr.; secretary-treasurer, L. J. Staley; technical services manager, P. C. Simpson.

GABON A.E.F.

Air Gabon.—B.P.240, Port Gentil.

Operates local services from Port Gentil. Now assumed to be in process of integration with Air Afrique (see under Ivory Coast).

Transgabon.—B.P.50, Libreville.

Transportes Aériens du Gabon began operations in 1951 and services are flown between Libreville and points in Equatorial Africa. Now assumed to be in process of integration with Air Afrique (see under Ivory Coast).

AIRCRAFT: DC-3, D.H. Rapide, Cessna 170B.

GHANA

Ghana Airways, Ltd. — Ghana House, P.O. Box 1636, Accra.

Formed in 1958 as the national carrier of Ghana. Services are operated within Ghana, and to Nigeria, the Ivory Coast, Liberia, Sierra Leone, Guinea, Gambia, Senegal, the Sudan, Egypt and Lebanon. Intercontinental services are operated between Accra and London (express and also via Barcelona and Tripoli/Rome).

AIRCRAFT: 2 Britannia 309-319; 8 Il-18, 1 An-12, 4 DC-3, 2 D.H. Heron, 3 Viscount 838; on order, 3 VC-10.

MANAGEMENT: Chairman, James Mercer; general manager, L. C. Giles; deputy general manager, F. G. Porter-Miles; sales manager, R. F. Muir; personnel manager, Godsaye-Simpson; chief accountant-secretary, J. H. Gell; chief pilot, Capt. C. B. Gavin-Robinson; chief engineer, J. G. Williams.

GUINEA REPUBLIC

Air Guinée.—Conakry.

Although its services do not yet appear in the *ABC*, Air Guinée, with the help of Russian and Czech crews and engineers, operates domestically and to the Mali Republic.

AIRCRAFT: 2 Il-18, 3 Avia Il-14.

GULF OF GUINEA

Serviço de Transportes Aéreos.—The Airport, Sao Tomé Island.

This carrier operates services between the islands of Sao Tomé and Prinçipe.

AIRCRAFT: 2 D.H. Rapide, 6 single-engined aircraft.

MANAGEMENT: Chief executive, V. C. Cortes.

IVORY COAST

Air Afrique.—Abidjan.

Originally planned as an Air France-U.A.T. subsidiary for operations in Africa, the basis of Air Afrique was changed earlier this year. It is now the operating company (with its headquarters in Abidjan, Ivory Coast) for 11 independent (previously French) African states, each of which contributes 6% of the working capital, with Air France and U.A.T. contributing 17% each. Interstate and regional services are operated and intercontinental services (aircraft chartered from Air France and U.A.T.) to Europe.

AIRCRAFT: 15 DC-4 for area international services.

KENYA

Caspair, Ltd., Nairobi West Airport and Plant House (P.O.B. 2238), Nairobi.

Primarily a charter operator and aircraft maintenance company, Caspair is associated with East African Airways and flies scheduled services round Lake Victoria from Entebbe, Uganda. It is a subsidiary of Campling Brothers and Vanderwal.

AIRCRAFT: 5 D.H. Rapide, 1 Cessna 182, 1 Piper Cub.

MANAGEMENT.—Directors, L. K. Campling, F. K. Campling and H. Vanderwal.

East African Airways Corporation.—P.O.B. 19002, Embakasi, Nairobi.

E.A.A.C. is Government sponsored, with certain guaranteed overdraft facilities and with technical advice from B.O.A.C. It was formed in 1946 to provide services between Kenya, Uganda, Tanganyika and Zanzibar. The Corporation also operates to the U.K., Bombay, Aden, Durban, Salisbury and Johannesburg.

AIRCRAFT: 2 Comet 4, 3 Canadair DC-4M, 9 DC-3; on order, 1 Comet 4, 3 F-27.

MANAGEMENT: Chairman, Sir Alfred Vincent; general manager, Col. M. P. C. Mostert, O.B.E.; secretary and asst. general manager, A. V. Gill, O.B.E.; chief engineer, A. E. Robinson, B.E.M.; commercial manager, P. A. Travers; operations manager, P. E. Henn; sales manager, J. W. Baines; stations and traffic manager, A. G. Molison, M.C.; chief accountant, S. G. Choppin.

One of East African Airways' two Comet 4s used for trunk route services.

Airlines of the World . . . .

An Air Congo DC-4 (ex-Sabena) at Embakasi Airport, Nairobi.

AFRICA (Contd.)

LIBERIA

Liberian National Airways.—Robertsfield, Liberia.

Government owned, this carrier operates local services in Liberia. It was formed in December, 1949.

AIRCRAFT (March, 1961): 2 DC-3.

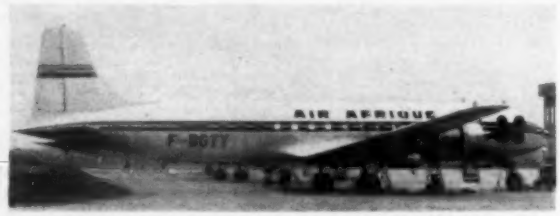
MANAGEMENT: President, F. H. Syphert.

LIBYA

N.A.A. Libiavia.—218, Gladdat Istiklal, P.O.B. 245, Tripoli.

Nord Africa Aviazione (now N.A.A. Libiavia) was founded in 1931 and started services in 1958. Operates over the Tripoli-Athens-Ankara route using a DC-6B chartered from U.A.T.

MANAGEMENT: President, Hag Mustapha Mezran; manager, Mario L. Lotti.



An Air Afrique DC-6B (ex-U.A.T.) at Orly, Paris.

MADAGASCAR

Air Madagascar.—8 Rue Général Roques (P.O.B. 437), Tananarive.

Founded in 1947, this company operates local services in Madagascar.

AIRCRAFT: See Madair, below.

MANAGEMENT: President, Gén. G. Fayet; director general, Michel Vernier.

Madair.—Tananarive.

This national company was formed early in 1961 by the Government of Madagascar (20%) Air France (44%) and Air Madagascar (36%). Madair takes over from Air Madagascar on Jan. 1, 1962. The first long-haul service, to Paris, was flown on Oct. 20 by T.A.I. DC-7.

AIRCRAFT: 2 DC-4, 8 DC-3, 6 D.H. Rapide, 1 MH 1521 Broussard, 1 Cessna 170.

MALI REPUBLIC

Air Mali.—P.O.B. 27A, Bamako.

This is the flag carrier of the Republic of Mali (Senegal and French Sudan). Services are at present operated regionally.

AIRCRAFT: 2 Il-18, 3 DC-3, 3 Aero 145.

MOROCCO

Royal Air Maroc.—5 Avenue de l'Armée Royale, Casablanca.

This national company was formed in 1957 when Morocco became independent. Its predecessor was Cie. Chérifienne des Transport Aériens, formed from the merger of Air Atlas and Air Maroc. It operates regional services and internationally to major points in France and Spain, and to Geneva, Frankfurt, Gibraltar, Oran and Dakar.

AIRCRAFT (March, 1961): 2 Caravelle, 4 L-749, 2 DC-3.

MANAGEMENT: President, Mohamed Laraki; director-general, André Faurous; sec. general, Hassan Ababou; commercial director, Mohamed Amine Bengeloun; admin. and financial director, Philippe Valent; technical director, Jean Delluc.

MOZAMBIQUE

Direcçao de Exploraçao dos Transportes Aéreos (DETA).—Avenida do General Machado 2-2° (P.O.B. 2060), Lourenço Marques.

Formed in 1936, DETA operates domestically within Mozambique and with international services to Johannesburg, Durban and Salisbury. It is Government owned.

AIRCRAFT (March, 1961): 6 DC-3, 2 DC-4, 4 D.H. Dove, 2 Ju 52/3M, 4 D.H. Rapide; on order, 3 F-27.

MANAGEMENT: Director-general, H. A. Brazao de Freitas; director, Lt.-Col. A. da Silva Paes; subdirector, Eng., Abel Neves de Azevedo.

NIGERIA

Nigeria Airways (WAAC (Nigeria), Ltd.).—Airways House, Lagos Airport (P.O.B. 136), Lagos.

Successor to the West African Airways Corporation (formed in 1946), Nigeria Airways was formed in 1958. B.O.A.C. Britannias are used to operate London-Lagos services. Earlier this year the Federal Government took over all shareholdings and it is now nationally owned.

AIRCRAFT: 7 DC-3; on order, 5 F-27.

MANAGEMENT: Chairman, Chief J. O. Fadahunsi; act. general manager and chief of flight operations, Capt. L. V. Messenger, O.B.E.; technical adviser, O. Coker; secretary and chief accountant, R. J. Tothill; traffic manager, R. P. Wheeler; chief engineer, W. H. Boyd.

PORTUGUESE GUINEA

Transportes Aéreos da Guiné Portuguesa.—Craveiro Lopes Airport (P.O.B. 77), Bissau.

This operator flies local services between Praia, Dakar and Bissau, connecting with the long-haul services at Dakar.

AIRCRAFT (1960): 2 D.H. Rapide, 2 Cessna 170B, 1 D.H. Heron 2E.

MANAGEMENT: Chief pilot, Manuel da Silva Gravato.

RHODESIA & NYASALAND

Central African Airways Corporation.—Salisbury Airport, Salisbury, S. Rhodesia.

The national airline of the Federation was formed in June, 1946. It provides services within the Federation and to East and South Africa, Mozambique and Katanga. As a partner in pool with South African Airways, E.A.A.C. and B.O.A.C., the latter operates on its behalf to London.

AIRCRAFT (mid-1961): 5 Viscount 700, 6 DC-3, 6 D.H.C. Beaver.

MANAGEMENT: Chairman, R. M. Taylor, C.B.E.; chief executive and general manager, Max Stuart-Shaw; asst. general manager, R. P. Hartley, M.B.E.; engineering manager, K. H. Greager, M.B.E.; chief accountant, W. B. James; operations manager, M. O'Donovan; planning manager, W. L. Stedman.

SIERRA LEONE

Sierra Leone Airways.—22 Pultney Street, Freetown.

The operations of Sierra Leone Airways were started by WAAC in 1958 to provide local services. Technical assistance is now provided by British United Airways and from this month B.U.A. Britannias will be chartered for Lagos-Freetown-London services.

AIRCRAFT: 1 Twin Pioneer; on order, 1 D.H. Heron.

MANAGEMENT: Manager, W. Taylor.

SOUTH WEST AFRICA

Suidwes Lugdiens (Edms.) Beperk.—P.O.B. 731, Windhoek.

The operating successor to South West Air Transport (formed in 1946) this company is the outcome of a merger, in 1959, of South West and Oryx Aviation (Pty.), Ltd., both of which are subsidiaries.

AIRCRAFT (1960): 2 Apache, 7 Navion.

MANAGEMENT: Director and general manager, G. T. van Rooyen.

SUDAN

Sudan Airways.—P.O.B. 253, Khartoum.

Formed in 1947, Sudan Airways is a Government-owned airline operating domestic services and the "Blue Nile Viscount" service between Khartoum, Cairo, Athens, Rome and London. External services are also operated to Egypt, Lebanon, Aden, Ethiopia, Uganda and Saudi Arabia.

AIRCRAFT: 1 Viscount 831, 7 DC-3, 4 D.H. Dove; on order, 4 F-27.

TUNISIA

Tunis Air.—47 rue de Portugal, Tunis.

Formed in 1948, 51% of Tunis Air's capital is held by the Tunisian Government and 49% by Air France. Operations were started in 1949. Scheduled services are flown within Tunisia and to Algeria, Corsica, France, Italy and Libya. The full name of the company is Société Tunisienne de l'Air.

AIRCRAFT (March, 1961): 3 DC-3, 2 DC-4; on order, 1 Caravelle.

MANAGEMENT: President, Azediene Abbassi; director-general, Pierre F. Delaunay.

One of the three ex-B.E.A. DC-3s given to Air Mali by the British Government.

UNION OF SOUTH AFRICA

Commercial Air Services (Pty.), Ltd.—Balgownie House, Commissioner Street (P.O.B. 2245), Johannesburg, Transvaal.

This British United Airways associate was formed in 1943 and scheduled services were started in 1948.

AIRCRAFT (1960): 2 Lodestar, 1 Cessna 310, 4 Cessna 180.

MANAGEMENT: Director and operations manager, J. M. S. Martin; director and commercial manager, L. Zimmerman.

South African Airways.—Railway Headquarters, Johannesburg.

Owned by the Union Government, S.A.A. was formed in 1934. Its predecessor, Union Airways, started operations in 1929, and was later taken over by the Railways Administration. S.A.A. operates domestically and to Europe, Australia, Southern Rhodesia and Mozambique.

AIRCRAFT (mid-1961): 3 Boeing 707-344, 4 DC-7B, 4 L-749, 7 Viscount 813, 5 DC-4, 6 DC-3.

MANAGEMENT: General manager, J. P. Hugo; chief executive, J. G. Grové; dep. chief executive, J. D. T. Louw; operations and flight technical manager, J. Adam; commercial manager, D. Beaton.

One of B.C. Air Lines' three Grumman Mallards taxies on to the "hard."

AMERICA (North)

CANADA

Air St.-Pierre.—St. Pierre, Miquelon Island.

Operates services between Miquelon Island and Sydney, Nova Scotia.

AIRCRAFT: DC-3.

B.C. Air Lines, Ltd.—Vancouver International Airport, Richmond, B.C.

This company, incorporated in 1943, serves Vancouver Island, the Queen Charlotte Islands and the west coast of British Columbia from nine bases. It also operates extensive charter services.

AIRCRAFT (mid-1961): 3 Grumman Mallard, 3 Norseman, 9 D.H.C. Beaver, 6 Cessna 180, 5 Cessna 170.

MANAGEMENT: President, F. G. Winspear; vice-president, B. W. Pitfield; general manager, G. L. Best; secretary-treasurer, E. R. Roach; comptroller, W. R. Whitaker; operations manager, W. F. Waddington; sales manager, S. Reynolds.

Eastern Provincial Airways.—Box 760, Gander, Newfoundland.

Operates services between St. John's (Tor Bay), Gander, Deer Lake, Goose Bay, Twin Falls and Wabush.

AIRCRAFT: DC-3, C-46, Catalina.

Leavens Bros., Ltd.—3220 Dufferin St., Toronto 19, Ontario.

This company was formed in 1927 as an operating partnership; was incorporated in 1932 as Leavens Bros. Air Services; and reorganized in 1953 under its present name. Scheduled services are operated between Windsor and Pelee Island, Ont.

AIRCRAFT (mid-1961): 1 Cessna T-50, 1 Piper Apache.

MANAGEMENT: President and general manager, C. R. Leavens; vice-president, R. H. Leavens; secretary, C. D. Leavens.

Maritime Central Airways, Ltd.—Charlottetown, Prince Edward Island.

This private company was formed in 1941. Scheduled services are flown between points in Prince Edward Island, New Brunswick, Nova Scotia, Quebec, Newfoundland, Labrador and the Northwest Territories.

AIRCRAFT (mid-1961): 1 Viscount 805 (since sold), 4 DC-3, 1 DC-4, 4 C-46, 1 Beech C-18; on order, 3 Herald 200.

MANAGEMENT: President, F. T. Briggs; vice-president and managing director, C. F. Burke; secretary-treasurer, A. M. Clark; operations manager, D. B. Simmons.

Matane Air Services, Ltd.—P.O. B.1900, Matane, Quebec.

Matane operates local scheduled services. It was formed in 1947 to provide services across the St. Lawrence River at Matane.

AIRCRAFT (mid-1961): 3 DC-3, 4 Lockheed 10A Electra, 1 Cessna T-50.

MANAGEMENT: President, G. Burnett; supt. of maintenance, J. G. Sirois; chief pilot, W. J. Anderson.

Nordair, Ltd.—Montreal International Airport, Dorval, P.Q.

This carrier operates over a northern network from Montreal to Quebec City, Roberval, Fort Chimo, Hall Beach, Frobisher, Cape Dyer, Val d'Or and Great Whale. On Jne. 30 this year it inaugurated a southern service, including Montreal, Kingston, Toronto, Oshawa, Sarnia, London and Windsor. In April, 1960, Nordair bought Wheeler Airlines' heavy transport division. Nordair is associated with Maritime Central.

AIRCRAFT: 6 DC-4, 5 C-46, 7 DC-3, 6 Catalina.

MANAGEMENT: Vice-president of administration, C. F. Burke; exec. vice-president, R. G. Lefrancois; manager of operations, Capt. J. F. Henley.

Northern Wings, Ltd.—P.O.B. 458, Seven Islands, P.Q.

Operates charter services in eastern Canada and a scheduled service to the Quebec-Labrador border.

AIRCRAFT (mid-1961): 3 DC-3, 2 Catalina, 4 D.H.C. Beaver, 1 D.H.C. Otter, 2 Norseman, 1 Beech 17, 4 Bell 47.

MANAGEMENT: President, J. Cauchon; vice-president, J. Brown; secretary-treasurer, A. Monast; general manager, W. G. McElrea.

Pacific Western Airlines, Ltd.—Vancouver Airport, B.C.

Formerly Central B.C. Airways, Pacific Western was established in 1946 by the late Russell Baker. In 1955 Pacific Western purchased Queen Charlotte Airlines and Associated Airways.

AIRCRAFT (mid-1961): 2 DC-4, 6 C-46, 5 DC-3, 22 D.H.C. Beaver, 4 D.H.C. Otter, 2 Cessna 182, 1 Cessna 180, 1 Beech 18, 1 Barkley Grow.

A Quebecair F-27—one of three in service with this Canadian carrier.

MANAGEMENT: President, K. J. Springer; vice-president, operations, R. H. Laidman; exec. vice-president, W. R. Harris; asst. vice-president, operations, Donald Watson; secretary-treasurer, D. F. Granger; director, instrument flight operations, J. F. Crosby; director, maintenance and engineering, W. M. Keddie; sales and traffic manager, J. B. McGuire.

Quebecair, Inc.—Rimouski, P.Q.

Formed as Rimouski Aviation Syndicate in 1946, this company was incorporated as Rimouski Airlines, Ltd., in 1947. In 1953, Rimouski merged with Gulf Aviation and assumed its present name. Points served include Montreal, Quebec, Rimouski, Mont Joli, Matane and Forestville.

AIRCRAFT (March, 1961): 3 F-27, 3 DC-3, 2 Convair 540, 2 Catalina, 1 C-46.

MANAGEMENT: President, Romeo Crevier; general manager, B. Ste-Marie; comptroller, L. Tardiff; maintenance supt., L. Lavigueur; traffic manager, A. Senecal.

Saskatchewan Government Airways.—The Airport, Prince Albert (P.O.B. 850), Saskatchewan.

This is a Crown Corporation formed in 1947 by the Provincial Government to serve Northern Saskatchewan. Scheduled and non-scheduled services are flown as far north as Uranium City. Control is vested in the Province's Minister of Natural Resources.

AIRCRAFT (mid-1961): 1 DC-3, 1 D.H.C. Otter, 5 Norseman, 5 D.H.C. Beaver, 7 Cessna 180, 1 D-18S Beechcraft.

MANAGEMENT: managing director W. A. Houseman; general manager, I. Macleod; traffic and sales manager, M. W. Christie; chief engineer, J. A. Pool; chief accountant, B. Webb.

TransAir, Ltd.—No. 5 Hangar, Winnipeg Airport, St. James, Manitoba.

TransAir was formed in 1956 as a result of the merger of Central Northern Airways and Arctic Wings.

AIRCRAFT (March, 1961): 4 DC-3, 1 DC-4, 1 Avro York.

MANAGEMENT: President and managing director, R. D. Turner, Q.C.; asst. general manager, U. S. Wagner; manager, mainline division, J. G. Twist; secretary-treasurer, F. C. McKay.

Trans-Canada Air Lines (Air Canada)—International Aviation Building, 1080 University Street, Montreal, P.Q.

Canada's nationally owned airline, T.C.A. was incorporated in April, 1937, to operate the Dominion's overseas and coast-to-coast services. North Atlantic services were started in 1943 and Caribbean services in 1948. All stock is held by Canadian National Railways. T.C.A.'s routes serve 40 communities in Canada and 21 in the U.S.A., the U.K., Europe and the Caribbean area.

AIRCRAFT (mid-1961): 10 DC-8, 17 Vickers Vanguard, 49 Viscount 700, 13 L-1049, 2 DC-3; on order, 1 DC-8, 6 Vanguard.

MANAGEMENT: President, G. R. McGregor; vice-president operations, H. W. Seagrim; vice-president sales, W. G. Wood; secretary, R. H. Tarr; comptroller, W. S. Harvey; general manager, purchase and stores, H. C. Cotterell.

Trans-Canada Air Lines put the first of its 23 Vickers Vanguards into service last February. One is seen here on the apron at Ottawa Airport.

Airlines of the World . . . .

The first of Los Angeles Airways' 28-passenger turbine-powered S-61Ls.

America (North) (contd.)

UNITED STATES

Alaska Airlines, Inc.—2320 Sixth Avenue, Seattle 1, Washington.

This carrier began operations in 1932 as McGee Airways and later became Star Air Lines. In 1942-43 Mirrow Air Services, Pollack Air Service and Lavery Airways were acquired; the present name was adopted in 1944. Alaska Airlines operates from Seattle to Fairbanks, its base for Alaskan services.

AIRCRAFT: 2 Convair 880-M, 2 DC-6, 3 DC-4, 2 Beechcraft, 5 LASA60 (Macchi).

MANAGEMENT: President and general manager, Charles F. Willis, Jr.; exec. vice-president, R. W. Gilbert; vice-presidents, L. H. Peterson, C. L. Miller, George Sindt, Raymond J. Wadsworth; treasurer, D. L. Ingalls.

Hawaiian Airlines has a fleet of six Convair 440s, one of which is seen here.

Alaska Coastal Airlines.—2 Marine Way, Juneau, Alaska.

Serves south-eastern Alaska and was formed in 1939 as a partnership between Alaska Air Transport and Marine Airways, both of which started in the 1930s.

AIRCRAFT (mid-1961): 2 Catalina, 8 Grumman Goose, 1 Bellanca Pacemaker, 3 Cessna 180, 1 Howard.

MANAGEMENT: Co-managers: S. B. Simmons and O. F. Benecke; operations manager, H. S. Gruening.

Allegheny Airlines, Inc.—Washington National Airport, Washington 1, D.C.

Allegheny provides air services in the Middle Atlantic-Ohio Valley-New England areas of the U.S.A. Its system takes in Boston, New York, Philadelphia, Baltimore, Washington, Pittsburgh, Buffalo, Cleveland and Detroit. Its predecessor, All American Airways, was formed in 1937; scheduled passenger operations were started in 1949.

AIRCRAFT: 5 Convair 540, 8 Convair 440, 16 Martin 202/202A, 1 DC-3.

MANAGEMENT: Chairman, Henry A. Satterwhite; president, Leslie O. Barnes; sen. vice-pres., David L. Miller. Vice-presidents: finance and secretary, Walter J. Short; flight and operations manager, Richard G. Dinning; maintenance and engineering, R. J. Masiello; sales and service, Nelson B. Fry, Jr.; legal affairs and economic research, Edwin I. Colodny.

Aloha Airlines, Inc.—Honolulu International Airport, Honolulu, Hawaii.

Aloha Airlines (previously Trans-Pacific Airlines, Ltd.) began operations in 1946 and now operates between each of the major islands.

AIRCRAFT (mid-1961): 6 F-27.

MANAGEMENT: Chairman, Ruddy F. Tongg; president, Dr. Hung Wo Ching; exec. vice-pres., Kenneth F. C. Char; sen. vice-pres., traffic and sales, Richard H. King; vice-pres. operations, Jack M. Brown; asst. vice-pres. public relations, E. Curtiss Cluff, Jr.; asst. vice-pres., passenger service, Osbuern McCraw; asst. vice-pres. sales, Clifford H. Bowman; treasurer and controller, Robert J. Norris; director of flight operations, Peter N. Economou.

American Airlines, Inc.—633 Third Avenue, New York 17, N.Y.

Founded in 1934, American Airlines succeeded American Airways, which was formed in 1930 as an amalgamation of a dozen or more operators whose beginnings go back to the early 1920s. American is one of the World's two biggest operators in terms of revenue ton-mileage and last year carried 8,613,903 passengers. Its route system is principally transcontinental, but stretches over most of the U.S.A., north into Canada and south into Mexico.

AIRCRAFT (July 1, 1961): 23 Boeing 707-023B/123B (turbofans), 26 707-023/123, 30 Electra, 20 DC-7, 16 DC-6B, 41 DC-6, 33 Convair 240, 13 DC-7F; on order, 15 Convair 990, 25 Boeing 727.

MANAGEMENT: President, C. R. Smith, exec. vice-president, finance and planning, W. J. Hogan; exec. vice-president, industry planning, O. M. Mosier; exec. vice-president and general counsel, G. A. Spater; vice-president and general manager, G. M. Sadler; vice-president, equipment research, W. Littlewood; vice-president, public relations, W. Player.

Apache Airlines.—P.O.B. 11035, Municipal Airport, Tucson, Arizona.

Apache operates services with Bonanzas between Phoenix, Tucson and Fort Huachuca.

ASA International Airlines.—International Airport, St. Petersburg 33, Florida.

This company (Aerovias Sud Americana, Inc.), was formed in 1947 as an irregular cargo carrier. In 1952, ASA was granted the first U.S. international all-cargo certificate. Operates to Central and South America.

AIRCRAFT (mid-1961): 2 DC-4, 3 C-46.

MANAGEMENT: President, Victor V. Carmichael, Jr.; vice-pres. and general manager, William M. Dunn, Jr.; director of operations, F. A. Swensen; treasurer, J. M. Rodriguez; secretary, W. M. Bussey.

Aspen Airways, Inc.—310 East Main Street, Aspen, Colorado.

Using Beech D-18S and Cessna 310, this airline operates between Denver and Aspen.

Avalon Air Transport.—Municipal Airport, Long Beach, California.

Avalon operates between Long Beach and Avalon, Catalina Island.

AIRCRAFT (mid-1961): 6 Grumman Goose (now 5), 1 Sikorsky VS-44A, 2 DC-3.

MANAGEMENT: President, W. R. Probert; vice-president, W. B. von Kleinsmid.

Bonanza Air Lines, Inc.—McCarran Field, P.O.B. 391, Las Vegas, Nevada.

Formed in 1945, Bonanza was certificated in 1949 with routes in Nevada and Arizona, serving Reno and Las Vegas, Nevada, and Phoenix, Arizona. Bonanza has since been certificated to operate two routes between Las Vegas and Los Angeles, a route between Las Vegas and Los Angeles, and non-stop and multi-stop services between Phoenix and Salt Lake City, Utah.

AIRCRAFT (mid-1961): 9 Fairchild F-27A.

MANAGEMENT: President, Edmund Converse; executive vice-president, G. Robert Henry; vice-president, operations, M. W. Reynolds; vice-president, traffic and sales, Larry Decker; vice-president, finance, R. J. Sherer; general counsel and secretary, Ralston O. Hawkins; director of research and development, Donald Neilson; assistant to president, Jack Arant; assistant to president, civic affairs, John Lindsay.

Braniff International Airways, Inc.—Exchange Park, Dallas 35, Texas.

Braniff Airways started operations in 1928; the word "International" was added in 1948 when services were extended into South America. It serves central areas of the U.S. between Houston, Minneapolis and Chicago, between Denver and Memphis and between points in Texas, the mid-south, Washington, D.C., and New York. International services are flown to Mexico and through South America to Buenos Aires.

AIRCRAFT (mid-1961): 4 Boeing 707-227, 3 Boeing 720-027, 8 Electra, 6 DC-7C, 10 DC-6, 6 Convair 440, 25 Convair 340, 1 DC-6A, 2 C-46 (freighter); on order, 1 720-027, 6 BAC One-Eleven.

MANAGEMENT: President, Chas.

Above, one of Flying Tiger's Canadair CL-44s which entered service this year.

A busy scene on the apron at Love Field, Dallas, Braniff's base, with one of this carrier's Boeing 707-227s being loaded and serviced.

E. Beard; exec. vice-president, J. W. Miller; senior vice-presidents, Rex Brack and R. V. Carleton. Vice-presidents: secretary, C. G. Adams; financial services and controller, F. J. Beisecker; purchasing and stores, Horace Bolding; traffic and sales, R. H. Burck; industrial relations, Malcolm Harrison; public relations, Walter M. Henshel; maintenance and engineering, J. R. Horton; operations, Dan Hughes; economic planning, Tom Robertson.

Capital Airlines.—Now merged with United Air Lines.

Central Airlines, Inc.—Amon Carter Field, Fort Worth, Texas.

Founded in Oklahoma in March, 1944, Central began certificated operations in September, 1949. Operations cover a network between Fort Worth/Dallas in the south, Denver/Amarillo in the west, St. Louis/Little Rock in the east and Kansas City in the north.

AIRCRAFT: 15 DC-3, 3 Convair 240.

MANAGEMENT: Chairman, F. Kirk Johnson; president, Keith H. Kahle; exec. vice-pres. and treasurer, F. E. Howe; vice-pres., operations, Russell L. Wageneck; vice-pres., traffic and sales, A. S. Aldridge.

asst. secretary/treasurer, R. B. Kiel; vice-pres., traffic and sales, C. E. Liske.

Continental Airlines, Inc.—Stapleton Airfield, Denver 16, Colorado.

Continental began operations in July, 1934, as the South-west Division of Varney Speed Lines, flying a 520-mile route between Pueblo, Colorado, and El Paso. The company is now a major regional trunk carrier, serving nine states and operating 707s between Los Angeles, Denver, Kansas City and Chicago, and throughout the south-west. On June 11, 1961, Continental inaugurated a 707 service between Houston and Los Angeles.

AIRCRAFT (Aug., 1961): 5 Boeing 707 (1 leased), 13 Viscount 812, 5 DC-7B, 1 DC-6B, 5 (leased) DC-3; on order, 4 707-024B.

MANAGEMENT: President, Robert F. Six; exec. vice-president, Harding L. Lawrence. Vice-presidents: personnel relations, Harrold W. Bell, Jr.; maintenance and engineering, Charles H. Calhoun; finance, Alexander Damm; sales, Marvin L. Davis; customer field services, E. Bailey Rances; operations, O. R. Haueter; customer service planning, Mark Kramer; regulatory proceedings, S. B. Redmond; property and purchasing,

One of Northwest's Boeing 720Bs, 13 of which are on order.

New York Airways is about to put Boeing-Vertol 107s into service. This picture shows one of its present fleet of Vertol 44Bs over the Hudson River with Manhattan's West 30th Street heliport in the background.

Chicago Helicopter Airways, Inc.—5240 West 63rd Street, Chicago 38, Illinois.

An associate of Helicopter Air Services, which had been flying mail and freight since 1949, C.H.A. started scheduled passenger services between Midway Airport and O'Hare Airport (later taking in Meigs Field) in November, 1956. Passenger services to Gary, Chicago Loop and Winnetka are also operated.

AIRCRAFT (end 1960): 7 S-58C, 4 Bell 47G; on order, 3 S-61.

MANAGEMENT: President and treasurer, John S. Gleason, Jr.; exec. vice-pres., C. W. Moore; vice-pres. and secretary, John C. Brogan; vice-pres., operations, R. S. Angstadt; Richard G. Schorling; economic planning, Chris F. Whelan; flight, Don R. Wilson.

Cordova Airlines, Inc.—P.O.B. 6203, Anchorage.

Cordova, formed in 1934, serves the Anchorage, Cordova and Seward area.

AIRCRAFT: 2 DC-3, 1 C-46, 4 Cessna 170/180, 2 Grumman Widgeon, 1 PA-14.

MANAGEMENT: President and general manager, Merle K. Smith; vice-pres., operations, D. P. Swanson.

Delta Air Lines, Inc.—Atlanta Airport, Atlanta, Georgia.

Delta originated in 1925 as the World's first crop-dusting company and started passenger services in 1929. Chicago and Southern Air Lines merged with Delta in 1953. Its domestic network connects New York, Atlanta, Houston and Dallas/Fort Worth; Detroit, Memphis and Houston; Chicago and Miami; and New Orleans, Houston and south-eastern points with San Francisco, Los Angeles, San Diego and Las Vegas. Delta serves a total of 70 cities. International services operate to Cuba, Jamaica, Aruba, Venezuela, Haiti and Puerto Rico.

AIRCRAFT: 6 DC-8, 12 Convair 880, 20 DC-7C/7B, 11 DC-6, 26 Convair 340/440, 5 C-46 (freighters); on order, 3 DC-8, 4 Convair 880.

MANAGEMENT: President and general manager, C. E. Woolman; exec. vice-pres., administration, and asst. secretary, Todd G. Cole; exec. vice-pres., operations, Charles H. Dolson. Vice-presidents: personnel, W. T. Beebe, Robert L. Griffith; legal (and secretary), R. S. Maurer; traffic and sales, T. M. Miller. Comptroller and treasurer, Robert Oppenlander.

Eastern Air Lines, Inc.—10 Rockefeller Plaza, New York 20, N.Y.

Eastern started operations in 1928 as Pitcairn Aviation; the title Eastern Air Transport was adopted in 1930. The present network extends from New York and Boston to Washington, Atlanta, New Orleans, Houston, Miami, Tampa, Mexico City and Puerto Rico; to Bermuda; and to Montreal. Services are flown to Miami from Chicago, Detroit, Cleveland, Pittsburgh, St. Louis, Minneapolis/St. Paul, Milwaukee, Cincinnati and Memphis.

AIRCRAFT (mid-1961): 11 DC-8, 39 Electra, 11 L-1049G, 12 L-1049, 55 Martin 404, 48 DC-7B, 10 L-1049C, 20 Convair 440, 7 DC-6B, 5 L-1049C freighters; on order, 15 Boeing 720, 5 DC-8, 40 Boeing 727.

MANAGEMENT: Chairman, Capt. E. V. Rickenbacker; president, Malcolm A. MacIntyre; exec. vice-pres., J. H. Halliburton; vice-pres., sales and advertising, W. L. Morrisette, Jr.

Ellis Air Lines.—P.O.B. 1059, Ketchikan, Alaska.

R. E. Ellis started operations in 1936 and the company was incorporated in 1940. In 1952 an international route—to Prince Rupert, British Columbia—was added to its intra-Alaskan services.

AIRCRAFT: 9 Grumman Goose, 1 Catalina, 1 Cessna 180.

MANAGEMENT: President, Robert E. Ellis; vice-pres., maintenance, John L. Sherman; vice-pres., operations, G. A. Bodding; secretary-treasurer, Norman T. Gerde.

Flying Tiger Line, Inc.—Lockheed Air Terminal, Burbank, California.

Flying Tiger was founded in June, 1945, by Robert W. Prescott. It specializes in scheduled all-cargo and non-scheduled passenger and cargo operations.

AIRCRAFT (mid-1961): 12 L-1049H, 2 CL-44D; on order, 8 CL-44D.

MANAGEMENT: President, Robert W. Prescott; executive vice-president and treasurer, Fred Benninger. Vice-presidents: sales, John L. Higgins and George T. Cussen; research and development, Wm. E. Bartling; operations, Frank B. Lynott; publicity, L. S. Kimball. Secretary and assistant treasurer, O. R. Burghardt.

Frontier Airlines, Inc.—5900 East 39th Avenue, Denver 7, Colorado.

Scheduled operations were started in November, 1946. The airline serves 65 cities in 10 Rocky Mountain, Western Great Plains States. The service ties together the main points in a large and rugged area.

AIRCRAFT: 8 Convair 340, 24 DC-3.

MANAGEMENT: Chairman and president, Lewis B. Maytag, Jr.; exec. vice-president, G. R. Woody; vice-president, asst. to president, Walter Swan; vice-president, traffic and sales, J. Dan Brock; secretary, John A. Love; treasurer, E. F. Dolansky.

Hawaiian Airlines.—International Airport, Honolulu, Hawaii.

One of the pioneer U.S. airlines, Hawaiian was incorporated in January, 1929. Originally named Inter-Island Airways, it was the first scheduled carrier in the U.S. to use all-cargo aircraft. Services throughout the Hawaiian Islands were started with Sikorsky amphibians. DC-3s were put into service in 1941, followed by Convair 340s in 1952 and Convair 440s in 1959.

AIRCRAFT (mid-1961): 6 Convair 440, 6 DC-3.

MANAGEMENT: Chairman, Stanley C. Kennedy; president, Arthur D. Lewis. Vice-presidents: finance and treasurer, Brian Cooke; flight, Kelly Weiss; sales and service, Jack C. Tobin; industrial relations, Lyman Conant; maintenance-engineering, William Crilly.

Inlet Airlines, Inc.—P.O. Box 6-244, Anchorage, Alaska.

Operates between Anchorage, Homer and Seldovia with DC-3, Lockheed 10E, D.H. Heron, D.H. Dove and Beech D-18S.

Lake Central Airlines, Inc.—Weir Cook Airport, Indianapolis 44, Indiana.

Originally Turner Airlines, the first scheduled flight was made in November, 1949. As its title suggests, Lake Central operates over a network south of Lake Erie—from Chicago in the west to Washington, D.C./Baltimore, in the east and Evansville and Cincinnati in the south.

AIRCRAFT: 22 DC-3, 5 Convair 340.

MANAGEMENT: Chairman, J. J. O'Connell; president, Gwin Hicks; exec. vice-pres. and general manager, Lloyd W. Hartman; treasurer, Jack L. Cory; vice-pres., traffic, D. S. Getchell; vice-pres., operations, R. W. Clifford.

Airlines of the World . . . .

United States (Contd.)

Los Angeles Airways, Inc.—P.O.B. 90155, Los Angeles Airport, Los Angeles 45, California.

The first scheduled air-mail helicoptor operator, Los Angeles Airways was formed in May, 1944. Operations were started in October, 1947, with five S-51s. Passenger services were started in 1954, using the available capacity on the mail services. Scheduled all-passenger services are flown between the International Airport and outlying points.

AIRCRAFT (Oct., 1961): 5 S-55, 2 S-51; on order, 5 S-61.

MANAGEMENT: President, C. M. Belinn; vice-pres. and treasurer, John T. Kane; secretary, Martin J. Burke; vice-pres., transportation, Fred W. Milam; operations manager, R. L. Bromberger; vice-pres., sales, Robert P. Hubley; asst. secretary and asst. treasurer, E. H. Slingsby.

Mackey Airlines, Inc. — Broward County International Airport, Fort Lauderdale, Florida.

Formed in 1946 as Mackey Air Transport, this company started scheduled services in 1952 and now operates locally and to the Bahamas and Cuba.

AIRCRAFT (mid-1961): 2 DC-3, 3 DC-4, 1 DC-6.

MANAGEMENT: Chairman and president, Joseph C. Mackey; exec. vice-president, secretary and treasurer, John H. Popham; vice-president, operations, Robert C. Tischler; vice-president, traffic and sales, Henry H. Johnson.

Mohawk Airlines, Inc.—Oneida County Airport, Utica, New York.

Mohawk was formed in 1945 as Robinson Airlines and took its present name in 1951. It serves 51 cities in the north-east section of the U.S. over a route system serving the States of Michigan, Ohio, Pennsylvania, New York, New Jersey, Vermont, New Hampshire, Connecticut, Rhode Island and Massachusetts.

AIRCRAFT: 5 Convair 440, 13 Convair 240, 7 Martin 404, 2 DC-3.

MANAGEMENT: Chairman, E. V. Underwood; president, Robert E. Peach; vice-president, Carl A. Benscoter; vice-president and general counsel, John R. Carver; vice-president, personnel, Harvey P. Barnard; vice-president, sales and services, Russell V. Stephenson; treasurer, Frank R. Chabot; asst. treasurer and chief accountant, Arthur D. Williams; vice-president, market development, William J. Mitchell; asst. vice-president, Thomas L. Boyd; secretary, Bruce C. McLean; exec. asst. to the president, Helen R. Thomas.

Naples Airlines.—Municipal Airport, Naples-on-the-Gulf, Florida.

This carrier operates between Miami and Naples, Florida, but the services are in suspension.

AIRCRAFT: Lockheed 10, Cessna 195.

National Airlines, Inc.—P.O.B. NAL, International Airport, Miami 59, Florida.

Formed in 1934 as a regional carrier, National is now a major long-haul airline serving the Atlantic Coast region, Florida, the Gulf Coast and the West Coast of the U.S. The present route network extends from Boston, New York and Washington to Miami and Havana, and westwards to New Orleans and Houston, Las Vegas, Los Angeles, San Diego, San Francisco.

AIRCRAFT (mid - 1961): 4 L-1049H, 9 DC-7/7B, 8 DC-6B, 4 DC-6, 6 Convair 440, 14 Electra, 3 DC-8; on order, 6 DC-8 Srs. 50.

MANAGEMENT: President, G. T. Baker; exec. vice-president, J. C. Brawner; sen. vice-president, Industrial relations, J. M. Rosenthal; vice-president, operations, maintenance and engineering, L. W. Dymond; vice-president, traffic and sales, W. F. Prigge.

New York Airways, Inc.—P.O.B. 426, La Guardia Airport Station, Flushing 71, New York.

Formed in August, 1949, as an all-helicopter operator. After flying mail services, N.Y.A. inaugurated the first scheduled helicopter freight service in January, 1953. The first scheduled passenger services were started in July, 1953, between La Guardia, New York International and Newark; Manhattan heliport was included in the passenger network from December, 1956. Regular services are also flown to points in Connecticut, New Jersey and New York.

AIRCRAFT (mid-1961): 5 Vertol 44B, 1 Bell 47J; on order, 5 Vertol 107 (plus 5 on option).

MANAGEMENT: President and director, Robert L. Cummings, Jr.; vice-president, J. E. Gallagher; vice-president and treasurer, W. W. Hogan; vice-president, Glen B. Eastburn; secretary, John H. Slate; vice-president, sales and services, R. Wheatland; asst. vice-president, operations, Leslie G. Carter; asst. vice-president, maintenance, Ray deHaan.

North Central Airlines, Inc.—6201 South 34th Avenue, Minneapolis 50.

Starting scheduled operations in February, 1948, this carrier is now certificated to serve 91 cities in Minnesota, Wisconsin, Michigan, Ohio, Illinois, Iowa, Indiana, Nebraska, North and South Dakota, and the Canadian provinces of Saskatchewan and Ontario. It is the largest of the U.S. local service airlines in number of passengers carried, as well as in weight of cargo and mail. North Central links the industrial centres of Cleveland, Detroit, Chicago, Milwaukee and Minneapolis/St. Paul with the smaller cities of the Midwest. It also offers daily scheduled flights to the popular vacation areas.

AIRCRAFT (mid-1961): 9 Convair 340, 32 DC-3.

MANAGEMENT: President and general manager, H. N. Carr; vice-presidents, traffic and sales, F. N. Buttomer; flight operations, A. D. Niemeyer; maintenance and engineering, R. H. Bendio, Sr.; industrial relations, A. E. Schwandt; treasurer, Bernard Sweet; counsel, A. L. Wheeler; secretary, John P. Dow; director, ground operations, T. M. Needham.

Northeast Airlines, Inc. — Logan International Airport, Boston 28, Massachusetts.

Formed in 1933 as Boston-Maine Airways, Northeast was the first to serve New England. With railway support, it was merged with Central Vermont Airways. The present name was adopted in 1940, when the Atlas Corporation became the main investor. Northeast operates on the Boston-New York-Miami run and into Montreal.

AIRCRAFT (mid-1961): 6 DC-3, 10 DC-6B, 10 Viscount 745, 6 Convair 880.

MANAGEMENT: Chairman, David A. Stretch; president and general manager, James W. Austin. Vice-presidents: administration, Hamilton Heard; operations, Thomas L. Grace; finance and treasurer, R. P. Lane, Jr.; technical services, Edmund O. Schroeder; director of public relations, Richard E. Fisher.

Northwest Airlines, Inc.—Minneapolis-St. Paul International Airport, St. Paul 11, Minnesota.

Northwest started operations in 1926, with a service from Minneapolis/St. Paul to Chicago, extended to Seattle in 1933 and became a transcontinental operator in 1945. The promotional name, Northwest Orient Airlines, was adopted after services to the Far East were started in 1947. Northwest's trunk services are from New York and Washington, D.C., to Portland and Seattle/Tacoma; from Miami, Fort Lauderdale, Tampa/St. Petersburg and Atlanta to Chicago and west; and to Korea, Okinawa, Formosa and the Philippines.

AIRCRAFT: 14 DC-6B, 10 DC-7C, 16 Electra, 5 DC-8, 6 Boeing 720B; on order, 3 720B.

MANAGEMENT: President and chief executive, Donald W. Nyrop; asst. to the president, B. G. Griggs; vice-president and general counsel, E. T. Nunneley; vice-president and secretary, A. E. Floan; asst. secretary, F. J. Scott. Vice-presidents: Orient region, W. E. Huskins; maintenance and engineering, F. C. Judd; economic planning, C. L. Stewart; finance, D. H. Hardesty; personnel, R. A. Ebert; sales, R. J. Wright, comptroller, M. J. Lapensky, asst. vice-president, properties, Dale Merrick; director of flight operations, K. B. Haugen; director of main base services, E. G. Stenborg; director of public relations, W. L. Pollock.

Northern Consolidated Airlines, Inc.—Box 6133, International Airport, Anchorage, Alaska.

Incorporated in November, 1945, Northern Consolidated was the result of a merger of four carriers—Northern Airways, Dodson Air Service, Ray Petersen Flying Service and Walatka Air Service. Services are flown from Anchorage and Fairbanks to points in south-western Alaska.

AIRCRAFT: 3 F-27B, 1 DC-3, 1 Beech 18, 10 Cessna Crane.

MANAGEMENT: President and general manager, Raymond I. Petersen; special asst. to president, James A. Dodson; vice-president and treasurer, S. B. Fitzhugh; secretary and general traffic manager, Victor R. Davis; general sales manager, Luther P. Fritz; supt. of maintenance, Alfred DuFault.

Ozark Air Lines, Inc.—Lambert Field, St. Louis 34, Missouri.

Formed in 1943, Ozark flew local services and obtained route rights in 1950 when Parks Air Lines were acquired. A network is flown within an area bounded by Chicago, Milwaukee, Minneapolis and Indianapolis in the north-east, Omaha in the north-west, Nashville in the south-east and Joplin in the south-west.

AIRCRAFT (Sept., 1961): 23 DC-3, 3 F-27; on order 4 Convair 240.

MANAGEMENT: Chairman, Floyd W. Jones; president, Joseph H. FitzGerald; secretary, Arthur G. Heyne; senior vice-president and general counsel, Jean Paul Bradshaw; treasurer, Elbert H. Green; vice-president, Edward J. Crane.

Pacific Air Lines, Inc.—International Airport, San Francisco 28, California.

Previously Southwest Airways Company, Pacific started scheduled operations in December, 1946. It serves communities, mainly in California, between Los Angeles and Medford, Oregon.

AIRCRAFT (March, 1961): 6 F-27, 7 DC-3, 8 Martin 404.

MANAGEMENT: President and general manager, John H. Connelly; exec. vice-president, T. R. Mitchell; vice-presidents: finance, asst. secretary, C. A. Myhre; operations, Harry White; traffic, R. E. Costello; public relations, Max A. King.

Pacific Northern Airlines, Inc.—400 Norton Building, Seattle 4, Washington.

Although based in Seattle, Pacific Northern is an Alaskan operator. Its president started Woodley Airways in 1932 and the company was the first scheduled operator in Alaska. Three main-line routes were developed—from Anchorage to Kodiak, Bristol Bay and Juneau—and in 1951 a service was opened to the U.S. Pacific north-west.

AIRCRAFT (mid-1961): 7 L-749, 3 DC-3; on order, 2 Boeing 720.

MANAGEMENT: President and general manager, A. G. Woodley; vice-presidents: traffic and sales, H. A. Olsen; operations, J. A. Cunningham, engineering and maintenance, J. H. Foster; industrial relations, Thomas Stuart; Alaska, Felix Aubuchon. Secretary-treasurer: C. W. Nelson.

Pacific Southwest Airlines.—Lindbergh Field, San Diego, California.

Operates scheduled services between San Diego, Los Angeles (International and Burbank) and San Francisco.

AIRCRAFT (mid-1961): 4 Electra.

MANAGEMENT: President, K. G. Friedkin; vice-president, sales, Hugh N. Wood.

Pan American-Grace Airways, Inc. (Panagra).—135 East 42nd Street, New York 17, N.Y.

Formed in 1929, Panagra is jointly owned by P.A.W.A. and W. R. Grace and Co., an industrial and trading concern. It operates within Bolivia and Ecuador; to Argentina, Bolivia, Chile, Colombia, Ecuador, Panama and Peru, and into the U.S.A. under an interchange agreement with National and P.A.W.A. An all-cargo service is operated from Miami to Chile.

AIRCRAFT (March, 1961): 4 DC-8, 6 DC-7B, 2 DC-6B.

MANAGEMENT: President, Andrew B. Shea; vice-presidents: general manager, Douglas Campbell; operations, Thomas J. Kirkland; comptroller, Andrew J. Phelan; sales and traffic, Cyrus S. Collins, Erwin Balluder, Edward L. Farrell, Treasurer, John S. Woodbridge; secretary, Walter A. Morris, Jr.

Pan American World Airways, Inc.—Chrysler Building, 135 East 42nd Street, New York 17, N.Y.

Pan American started U.S.-flag international services in 1927—from Key West, Florida, to Havana, Cuba—with a Fokker F-7. Services were later extended through the Caribbean and into Central and South America. A service was opened across the Pacific to Manila in 1935 and in 1939 a North Atlantic service was started. A network through Europe and Asia

Apron scene at San Francisco International with one of T.W.A.'s Boeing 707-131s ready for engine starting.

was developed and extended around the World. Transatlantic turbojet services were started in October, 1958. By the end of 1960 turbojets were being operated on all major round-the-world sectors.

AIRCRAFT (mid-1961): 20 DC-8, 6 Boeing 707-121, 20 707-321, 6 707-331, 8 Stratocruisers, 33 DC-6B, 12 DC-7C, 7 DC-7B, 2 DC-4, 1 DC-6A (cargo), 11 DC-7C (cargo), 13 DC-4 (cargo), 2 DC-4 (passenger/cargo); on order, 5 707-321B.

MANAGEMENT: President, Juan T. Trippe. Exec. vice-presidents: administration, Roger Lewis; Latin American Division, Wilbur L. Morrison; Overseas Division, Harold E. Gray; Robert B. Murray, Jr.; assistant to president, John C. Leslie. Vice-presidents: general counsel, Hubert A. Schneider; Samuel F. Pryor; Franklin Gledhill; traffic and sales, Willis G. Lipscomb; development, John B. Gates. Treasurer, Robert G. Ferguson; comptroller, John S. Woodbridge.

Piedmont Aviation, Inc. (Piedmont Airlines).—Smith Reynolds Airport, Winston-Salem 1, N. Carolina.

Piedmont was formed in 1940 as a sales organization and school. The Airlines Division was created in 1947 and the first service was flown in February, 1948. Piedmont now serves a seven-state area—North Carolina, South Carolina, Virginia, West Virginia, Tennessee, Ohio, Kentucky—of the District of Columbia.

AIRCRAFT (Sept., 1961): 8 F-27, 17 DC-3.

MANAGEMENT: President and treasurer, T. H. Davis; vice-presidents, C. G. Brown, Jr.; H. K. Saunders, and R. S. Northington; secretary and asst. treasurer, M. F. Fare; asst. controller, T. W. Morton.

Provincetown-Boston Airline, Inc.—Municipal Airport, Provincetown, Massachusetts.

Operates a feeder service between Provincetown and Logan Airport, Boston.

AIRCRAFT: 2 Cessna 190, 2 Lockheed 10.

MANAGEMENT: President/treasurer, J. C. Van Arsdale.

Reeve Aleutian Airways, Inc.—P.O.B. 559, Anchorage, Alaska.

Founded in 1932 and certificated in 1948, Reeve operates scheduled services serving Alaska, the Aleutians and Pribilof Islands.

AIRCRAFT: 2 DC-4, 2 DC-3, 2 C-46, 2 Grumman Goose.

MANAGEMENT: President and supt. of operations, R. C. Reeve; secretary - comptroller, Margaret Rutledge.

Riddle Airlines, Inc.—P.O.B. 48-535, International Airport Branch, Miami 48, Florida.

Charter operations were started by Riddle in 1947 on the New York—San Juan (Puerto Rico) run. Daily scheduled freight services are now operated Boston-New York-Miami-San Juan and Miami-Atlanta-Chicago with seven intermediate stops. On July 1 Riddle was awarded three-year MATS Logair and International contracts. Commercial cargo and transatlantic group charters are also operated.

AIRCRAFT: 10 DC-7C/F, 7 A.W. 650 Argosy, 1 DC-4, 26 C-46, 4 C-46R.

MANAGEMENT: President, Robert M. Hewitt; sen. vice-president, Howard K. Howard. Vice-presidents: contract and charter sales and Washington representative, A. J. Rome; operations, Joseph V. Dillard; maintenance and engineering, D. E. Howard; market research and sales development, Howard A. Berrian; military operations, Howard R. Donalson; scheduled air freight, Charles L. Hood; treasurer, E. M. Leath, Jr.; regional, New York, Harry T. Weaver. Secretary, Margaret Minners; comptroller, Ben D. Kouns.

San Francisco and Oakland Helicopter Airlines, Inc.—San Francisco International Airport, San Francisco 28, California.

This company, formed on Jan. 6, 1961, started operations on June 1. Services with two amphibious S-62s link San Francisco and Oakland airports with downtown heliports in both cities on a 60-flights-daily schedule. Extensions to other communities are planned.

AIRCRAFT: 2 S-62.

MANAGEMENT: President, Mervin F. Bagan; vice-president, operations, Bruce F. DeHaas; vice-president, asst. to president, John J. Cunningham; comptroller, Ernest M. Bishop; director of maintenance, Chester M. Schmidt.

Seaboard World Airlines.—Seaboard World Building, New York International Airport, Jamaica 30, N.Y.

Founded in 1946, Seaboard and Western Airlines (as the company was known until this year) operated non-scheduled services until 1955, when it was certificated for regular North Atlantic all-freight operations. The right to carry mail was granted in 1958. Seaboard now operates 12 flights a week in each direction between New York and 19 points in the U.K. and Europe. This year Seaboard put Canadair CL-44 swing-tail freighters into operation and opened a new cargo handling and clearance warehouse at London's Heathrow airport.

AIRCRAFT: 2 CL-44, 9 L-1049, 3 DC-4, 1 C-46; on order, 3 CL-44.

MANAGEMENT: President and chairman, Richard M. Jackson. Sen. vice-presidents: operations, Carl D. Brell; finance and treasurer, Samuel I. Fondiler; sales, John H. Mahoney. Vice-presidents: secretary, Wallace P. Neth; cargo sales, Alastair Thomson; administration, John H. Rosenwald.

South Pacific Air Lines.—311 California St., San Francisco 4, California.

South Pacific was incorporated in 1952. The first flight (from Honolulu to Bora Bora, with flying-boat transfer to Tahiti) was made in April, 1960, operating as a subsidiary of The Robert Dollar Co. The first direct flight was made on Oct. 21, 1960—as soon as the airport at Papeete had been opened. C.A.B. certification is held for services to Samoa and the Fiji Islands.

AIRCRAFT: 1 L-1049.

MANAGEMENT: Chairman, R. Stanley Dollar, Jr.; president, J. Harold Dollar, Jr. Vice-presidents: S. L. Wilson; W. F. Warren; J. D. Hopkins. Treasurer, G. A. Harrison, Jr.; secretary, R. P. Seeley; sales manager, Malcolm McDonald.

Southern Airways, Inc. — 1101 Brown-Marx Building, Birmingham, Alabama.

Formed in Delaware in 1943, Southern started operations in 1949, with a system linking cities in south-eastern states. The present network lies between Jacksonville (Florida), Charlotte (North Carolina), Nashville and Memphis (Tennessee) and New Orleans (Louisiana).

AIRCRAFT (mid-1961): 23 DC-3.

MANAGEMENT: President, F. W. Hulse; vice-president, sales, Graydon Hall; vice-president, operations, W. S. Magill; secretary-treasurer, G. F. Estey.

Tag Airlines, Inc.—Detroit City Airport, Detroit 13, Michigan.

Formerly Taxi Air Group, Tag began operations in April, 1956. It operates between Chicago (Meigs Field), Rockford, Akron, Detroit and Cleveland.

AIRCRAFT (mid-1961): 1 D.H. Heron, 2 D.H. Dove.

MANAGEMENT: General manager, E. F. Knight; secretary/treasurer, W. W. Knight; vice-president, operations, E. A. Eklund; vice-president, sales, W. J. Swann.

Trans Caribbean Airways, Inc.—375 Park Avenue, New York 22, N.Y.

This carrier operates between New York, San Juan, Puerto Rico and Aruba (Neth. Antilles).

AIRCRAFT: 5 DC-6A/B, 1 DC-4, 2 C-46, 1 DC-8.

MANAGEMENT: President, O. Roy Chalk; exec. vice-president, treasurer and director, Irving M. Buckley; vice-president, traffic and sales, David J. McFarland; passenger and interline sales mgr., Herbert Keilsen; cargo sales mgr., James H. McGuinness; asst. vice-president, flight operations, Walter J. Gromel; operations mgr., Edward Mayer; asst. vice-president, maintenance, John F. Peterson.

United Air Lines has 20 Caravelle VIRs on order and some are already in service. This is the prototype, in United styling but with French registration.

Trans-Texas Airways.—International Airport, Houston 17, Texas.

Trans-Texas serves points in Texas, Louisiana, Mississippi, Arkansas and Tennessee. Originally known as Aviation Enterprises, Ltd., scheduled services were started in 1947.

AIRCRAFT (mid-1961): 23 DC-3, 7 Convair 240.

MANAGEMENT: President, R. E. McKaughan. Vice-presidents: operations planning, H. E. Erdmann; public affairs, J. K. Ayer; personnel, P. S. Reid; purchasing, W. C. Leatherwood; policy administration and treasurer, H. E. Kriegel; training, J. M. Brooks; asst. to president, R. E. McKaughan, Jr.

Trans World Airlines, Inc.—380 Madison Avenue, New York 17, N.Y.

The original T.W.A. (Transcontinental and Western Air) was formed in 1930 after a merger of four airlines; the present name was adopted in 1950. It is 78% owned by Hughes Tool; this shareholding is now a trusteeship. A domestic and a transcontinental operator, T.W.A. is also one of the two main international U.S. carriers, with services to Europe, North Africa, Egypt, India and the Far East. A polar route service provides direct schedules between the U.S. west coast and Europe. Turbojet services are now operated to all overseas destinations.

AIRCRAFT: (Sept., 1961): 15 Boeing 707-131, 12 707-331, 4 720B (on lease), 18 Convair 880, 12 L-1649A, 12 L-1649A (freighters), 25 L-1049G, 4 L-1049H, 5 L-1049, 26 L-749A, 12 L-749, 25 L-049, 1 DC-4 (freighter), 1 C-82; on order, 2 Convair 880, 20 Caravelle 10A, 20 Boeing 707-131B, 6 707-331B.

MANAGEMENT: Chairman, Ernest R. Breech; president, Charles C. Tillinghast, Jr.; sen. vice-president and system general manager, Floyd D. Hall; sen. vice-president, finance and treasurer, Albert V. Leslie; sen. vice-president, industry affairs, E. O. Cocke; vice-president and general sales manager, Louis P. Marechal; vice-president and general transportation manager, J. E. Frankum.

Trust Territory Operations.—Pan American World Airways, Trust Territory Division, P.O.B. 542, Agana, Guam, Marianas.

Previously the responsibility of Transocean Air Lines, Trust Territory Operations are now handled by Pan American. They consist of local services between Guam and the Marshall Islands.

United Air Lines, Inc.—5959 S. Cicero Ave., Chicago 38, Illinois.

Formed in 1931 by the merging of four pioneer airlines, United's operational history goes back to April 6, 1926, when one of its predecessor companies, Varney Air Lines, began Government contract air-mail service. United has been responsible for many technical and service innovations, such as stewardess service (1930) and nationwide electronic reservations (1961). Capital Airlines was merged into United in June, 1961, and United serves 116 cities in 32 states and British Columbia.

AIRCRAFT (mid-1961): 38 DC-8, 18 Boeing 720, 41 Viscount, 2 Caravelle, 39 DC-7, 41 DC-6B, 38 DC-6, 6 DC-7A, 7 DC-6A, 28 Convair 340, 9 DC-3, 2 L-049; on order, 18 Caravelle, 11 Boeing 720, 40 Boeing 727.

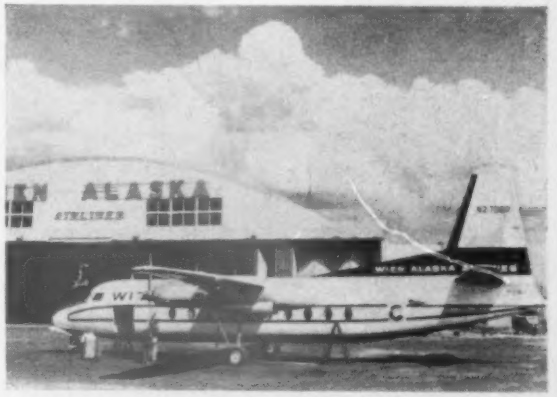
MANAGEMENT: President, W. A. Patterson. Exec. vice-presidents: finance and property, Curtis Barkes; administration, A. M. de Voursney; operations, George Keck. Sen. vice-presidents: engineering and maintenance, J. A. Herlihy; transportation services, Fred A. Brown; flight operations, D. R. Petty; sales and advertising, R. E. Johnson; personnel, R. F. Ahrens; economic planning, H. E. Nourse; law, C. F. McErlean. Vice-president and asst. to president: R. M. Ruddick; vice-president, management services and control, W. E. Alberts; secretary and asst. to president, S. P. Martin; vice-president and treasurer, R. E. Bruno.

United States Overseas Airlines, Inc.—Cape May County Airport, P.O.B. 234, Wildwood, N.J.

Primarily a non-scheduled freight carrier, U.S. Overseas began operations in 1946 and operates scheduled passenger services between Miami, New York, Chicago, Los Angeles and San Francisco and from Los Angeles to Honolulu and Okinawa.

AIRCRAFT (March, 1961): 1 DC-6B, 3 DC-6A, 13 DC-4.

MANAGEMENT: President, R. W. E. Cox; exec. vice-president, Ralph Cox, Jr.; vice-president, D. C. Cox, Jr.; secretary, R. L. McSweeney.



One of Wien Alaska's two F-27s at their Fairbanks base.

Airlines of the World . . . .

United States (contd.)

West Coast Airlines, Inc.—Georgetown Station, Seattle 8, Washington.

West Coast was certificated as a local-service operator in 1946. Permanent certification was received in February, 1956. It serves most of the scheduled airline stops in Washington, Oregon and Idaho—plus Logan and Salt Lake City in Utah; Sacramento, Oakland and San Francisco in California; Kalispell, Cut Bank-Shelby and Great Falls in Montana; and Calgary, Alberta, Canada.

AIRCRAFT (mid-1961): 6 F-27, 14 DC-3.

MANAGEMENT: President, Nick Bez. Vice-presidents: asst. to the president, Herman F. Scheurer, Jr.; sales, George Hatch; community and public relations, Tom Croson; planning and administration, E. B. Code; maintenance, Stanley M. Selby; operations, S. R. Severtson. Secretary-treasurer, Lewis Hawkinson.

Western Air Lines, Inc.—P.O.B. 90005, Airport Station, Los Angeles 45, California.

Oldest airline in the U.S.A., Western operated its first scheduled service in 1926 between Salt Lake City, Las Vegas and Los Angeles. It now operates over networks in California, Oregon, Washington, Nevada, Arizona, Utah, Wyoming, Idaho, Montana, Nebraska, S. Dakota, Colorado and Minnesota and into south-west Canada and Mexico.

AIRCRAFT (March, 1961): 9 Electra, 26 DC-6B, 2 Boeing 707, 2 Boeing 720; on order, 2 Boeing 720, 3 Electra.

MANAGEMENT: President, Terrell C. Drinkwater. Vice-presidents: operations, Stanley R. Shatto; service, Marvin W. Landes; sales, Arthur F. Kelly; treasurer, J. Judson Taylor; legal and secretary, D. P. Renda; administration, Stanley Gewirtz and G. G. Brooder.

Western Alaska Airlines, Inc.—Box 131, Dillingham, Alaska.

W.A.A. was incorporated in January, 1953, and consolidated two former partnerships (Moran and Ball and Don and Clarence Wren) which were formed in 1943-1946. The partners became directors and officers of the corporation. The route network covers the entire Bristol Bay region of the Alaskan S.-W. coast.

AIRCRAFT: 1 Beech Bonanza; 4 Cessna 180; 1 Grumman G21A, 1 Lockheed L-12A.

MANAGEMENT: President, Albert W. Ball; vice-president, Myron S. Moran; secretary-treasurer, Clarence Wren.

Wien Alaska Airlines.—P.O. Box 649, Fairbanks, Alaska.

The history of Wien Alaska goes back to 1924, when it started operations as Northern Air Transport—the company's title until 1936. The routes of Byers Airways were taken over in 1956. Schedules include services from Fairbanks to Nome, Point Barrow and Fort Yukon.

AIRCRAFT: 2 F-27A, 5 C-46, 2 DC-3, 8 Twin Beech, 3 Norseman, 1 Beaver, 13 Cessna 180, 2 Cessna 185.

MANAGEMENT: President, Sigurd Wien; exec. vice-president and treasurer, Geo. B. Rayburn. Vice-presidents: operations, Fritz Wien; public relations, Noel Wien; traffic, A. E. Hagberg. Secretary, Richard M. King.

AMERICA (Central and South)

ARGENTINA

Aerolineas Argentinas. — Paseo Colon 185, Buenos Aires.

A department of the Ministry of Transport, and founded in 1949, Aerolineas operates domestically and internationaly to neighbouring countries and to the U.S.A. and Europe.

AIRCRAFT: 4 Comet 4, 3 DC-6, 6 DC-4, 3 Convair 330, 5 Sandringham, 15 DC-3; on order, 9 Avro 748, 3 Caravelle VI.

MANAGEMENT: President, Brig. Miguel Moragues; vice-president, Brig. Ernesto Mirant-Borde; admin. director, Dr. Santos Elespe; commercial director, Martin Saez; operations manager, Edwin Metcalfe; maintenance manager, M. Taicher; personnel manager, Dr. Joaquin Segura.

Aerotransportes Litoral Argentino S.A.—Sarmiento 859, Rosario.

Formed in 1958, A.L.A. has a licence to operate between Rosario and Buenos Aires and to other points.

AIRCRAFT: 4 DC-3.

Cia. Argentina de Aeronavegacion S.A. (Norsur).—Av. Leandro N. Alem 675, Buenos Aires.

Norsur started scheduled operations in March, 1959. A domestic network in northern Argentina is served from Buenos Aires.

AIRCRAFT (March, 1961): 2 DC-3, 8 Lodestar.

MANAGEMENT: General manager, Eugenio Otto Rupnik; traffic and sales manager, Luis Gonzalez King; operations manager, Carlos A. Urtubey.

Cia. Argentina de Transportes Aereos S.A. (Austral).—Leandro N. Alem 498, Buenos Aires.

This company operates from Buenos Aires to Mar del Plata and Bahia Bianca, and to Rio Grande.

AIRCRAFT (March, 1961): 4 C-46.

MANAGEMENT: President, Dr. Carlos Menendez Behety; vice-president, Alberto de Ridder; general manager, Jorge Rojas.

Ini Airlines (Aerolineas Ini y Cia. S.A.).—P.O.B. 1994, Buenos Aires, and P.O.B. 48-225, International Airport Branch, Miami, Florida, U.S.A.

Since January, 1960, this carrier has operated a service from Buenos Aires through Chile, Peru, Ecuador and Panama to Miami.

AIRCRAFT (March, 1961): 3 DC-4, 1 DC-6.

MANAGEMENT: President and general manager, Jose Ini; operations manager, Santiago Posadas; legal counsel, Hector A. Perucchi; U.S. manager, John F. Barrett.

Lineas Aereas Chaquenas Soc. de Econ. Mixta (Aero Chaco).—Santa Maria de Oro 145, Resistencia, Chaco.

Aero Chaco operates local services in the Resistencia area.

AIRCRAFT: 2 D.H.C. Beaver.

MANAGEMENT: President, Dr. Oscar E. Torres; secretary, Ambrosio J. Puja.

Lineas Aereas del Estado (LADE).—Corrientes 480, Buenos Aires.

LADE was formed by the Argentine Air Force and started domestic operations on September 4, 1940. Services were taken over by Aerolineas Argentinas, but were restarted in 1947. Operates domestically.

AIRCRAFT (mid-1961): 2 DC-3, 2 DC-4, 2 Viking.

MANAGEMENT: Director, Brig. D. Mario Romanelli; dep. director, Vice Cdre. D. Ricardo Witte; admin. manager, D. Oscar Enrique Spinilo; traffic manager, D. Domingo Petronio.

Primera Linea Aerea Santafesina S.A. (PLAS).—Vera Esquino, 25 de Mayo, Santa Fé.

Operates between Santa Fé Rosario and Buenos Aires.

AIRCRAFT (March, 1961): 1 DC-3, 1 Lockheed 10A.

Trans Atlantica Argentina.—Buenos Aires.

Operates from Buenos Aires to Rio, Dakar, Lisbon and Geneva.

AIRCRAFT: 2 L-1649A (ex-T.W.A.).

Transcontinental, S.A. — Cerrito 1117, Buenos Aires.

Formed in 1956, California Eastern Aviation holds 25% of the capital. A long-haul service is operated to Sao Paulo, Rio de Janeiro, Caracas and New York, with domestic and international services to Paraguay and Uruguay.

AIRCRAFT (March, 1961): 2 Britannia 308, 2 L-1049G, 7 C-46.

MANAGEMENT: President, Manuel Masllorens; vice-president, Ramon Masllorens; general manager, Adolfo Aliaga Garcia.

Transportes Aereos Buenos Aires (TABA).—Avenue Cordoba 949, Buenos Aires.

Operates local services.

AIRCRAFT: 2 DC-3, 2 Viking, 2 Beech D-18.

BAHAMAS

Bahamas Airways, Ltd.—Shirley St. (P.O.B. 65), Nassau, N.P.I.

Formed in 1936, Bahamas Airways was taken over by B.S.A.A. and then by B.O.A.C. in 1949. In 1959 80% of the shareholding was taken up by J. E. Rylands (Skyways) and David Brown. B.O.A.C. has since repurchased the whole shareholding. Services are operated through the islands and to Florida.

AIRCRAFT: 5 DC-3, 3 Grumman Goose, 2 Viscount, 1 Aero Commander.

MANAGEMENT: President, Sir George Roberts, C.B.E.; chairman and managing director, Air Cdre. G. J. Powell, C.B.E.; traffic manager, W. Jones; secretary/chief accountant, M. Ballamy; chief engineer, B. G. Peterson; operations manager and chief pilot, P. Farringdon; sales manager, D. F. Johnson.

Cunard Eagle Airways (Bahamas), Ltd.—Windsor Field, Nassau, N.P.I.

An associate of Cunard Eagle Airways (see under U.K.). Operates between Nassau and Miami.

AIRCRAFT: 2 Viscount 155 (shared with C.E.A. Bermuda).

MANAGEMENT: chief executive, M. A. Guinane; general manager, H. P. Snelling; general sales manager, J. Hillgoth.

BERMUDA

Cunard Eagle Airways (Bermuda), Ltd.—Radio Centre, Bermudiana Road, Hamilton.

An associate of Cunard Eagle Airways (see under U.K.). This company operates between Bermuda and New York; Bermuda and Nassau; and Bermuda and London.

AIRCRAFT: See above.

MANAGEMENT: chief executive, M. A. Guinane; general manager, H. P. Snelling; general sales manager, A. M. Hudson.

BOLIVIA

Lloyd Aereo Boliviano, S.A.—Casilla 132, Cochabamba.

One of the first two airlines formed in Latin America, this company was founded in 1925 by the German colony in Bolivia. In 1941 it became a Bolivian national company, and from that year until 1946 was administered by Panagra. Since then it has been operated entirely by Bolivian interests, the government holding 58.57% of the capital. Apart from internal services, L.A.B. flies internationally to Chile, Argentina and Brazil.

AIRCRAFT (mid-1961): 9 DC-3, 2 Boeing B-17, 2 DC-4.

MANAGEMENT: President, Alvaro Perez del Castillo; admin. manager, Alberto Arze Quiroga; general manager, Rudolfo Galindo; operations supt., Juan Moreira; maintenance supt., Carlos Arze; communications supt., Victor Veltze; traffic supt., E. Aguirre; accountant-general, Manuel Yañez.

BRAZIL

Lóide Aéreo Nacional, S.A.—Avenida 13 de Maio, 13-27 Andar, Rio de Janeiro.

This company was established in 1951 as a consortium of three carriers. Scheduled services had been started by Lóide in 1947. A large domestic network is served.

AIRCRAFT (March, 1961): 7 DC-4, 8 C-46.

MANAGEMENT: President, Col. Marcilo Gibson Jacques; admin. director, José Bugarin Maloper; commercial director, Anello G. Moles; technical director, Brig. Newton Lagres de Silva.

Navegacao Aerea Brasileira.—Santos Dumont Airport, Rio de Janeiro.

This carrier was founded in 1939, began operations in 1941, suspended them in 1948 and restarted in 1951. It operates stopping services from Rio to Vitoria and Belo Horizante.

AIRCRAFT (March, 1961): 8 DC-3, 11 C-46.

MANAGEMENT: President, Dr. M. Barbosa; technical manager, R. Portela; commercial manager, G. de Oliveira.

Panair do Brasil, S.A.—Santos Dumont Airport, Rio de Janeiro.

Originally a subsidiary of Pan American and founded in 1924, Panair is now wholly owned by Brazilian interests. International services are operated to Argentina, Uruguay, Paraguay, Chile and to points in Europe and the Middle East.

AIRCRAFT (Aug., 1961): 2 DC-8, 4 DC-7C, 12 L-049, 4 Catalina; on order, 4 Caravelle VIR.

MANAGEMENT: President, Dr. Paulo de Oliveira Sampaio; supt. director, Dr. Jorge Mourão.

(*Continued on page 607*)

An Aerovias Brasilia (REAL) Convair 340 at Congonhas Airport, Sao Paulo.

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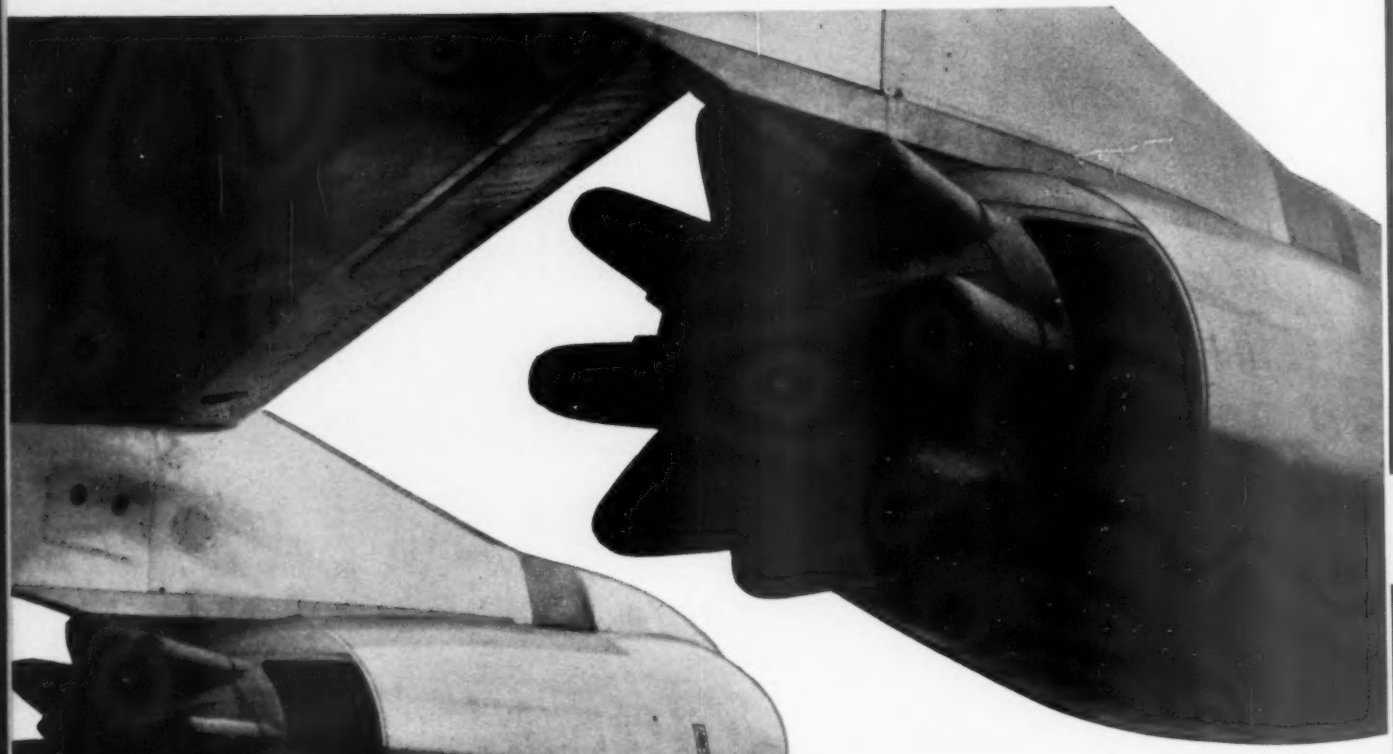

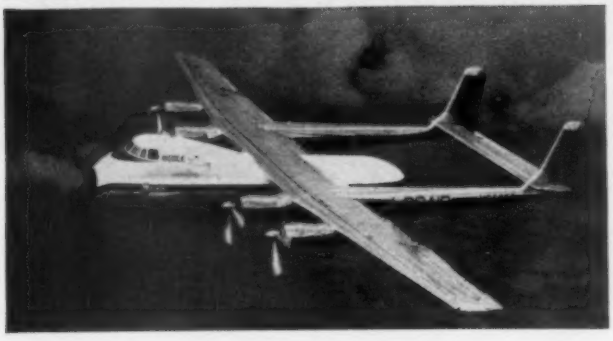

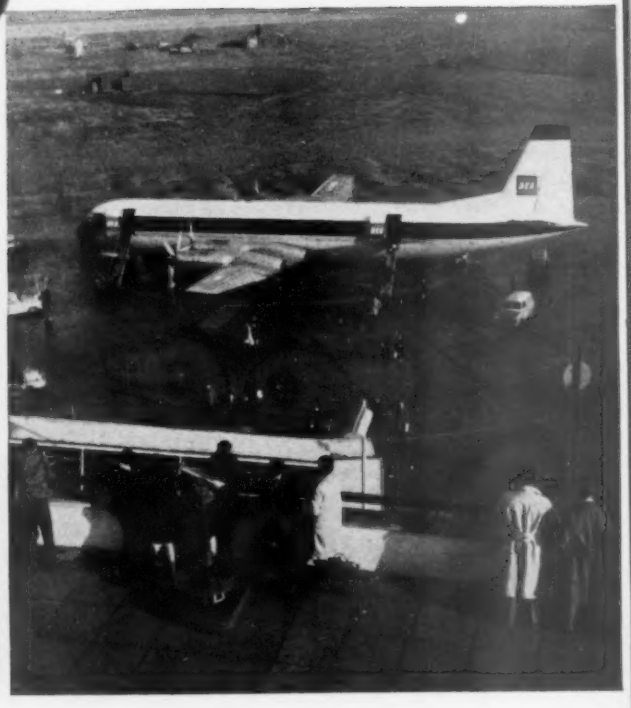

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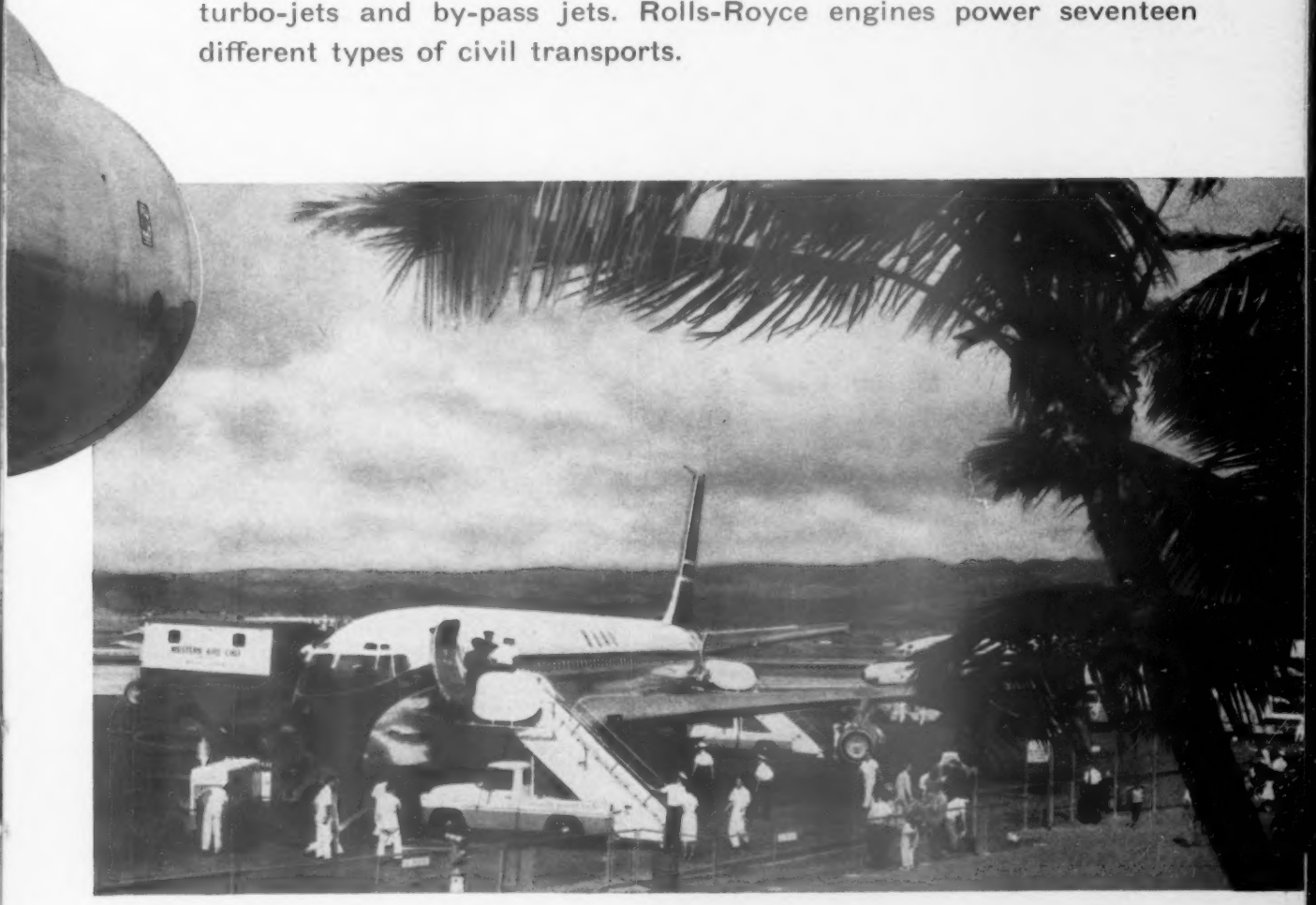

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HOW'S BUSINESS AT BIRMINGHAM?

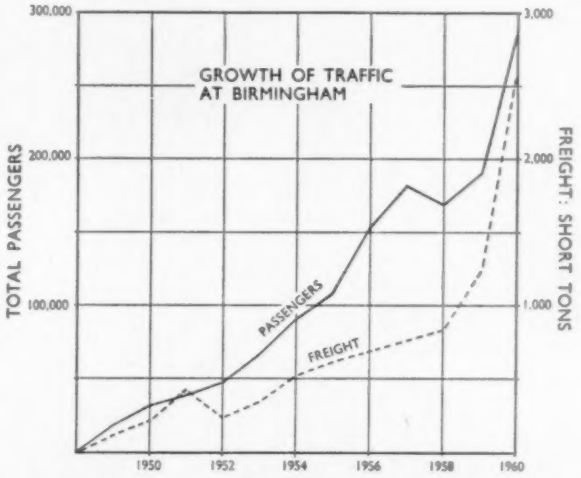
What makes Birmingham airminded?
Because business is booming in the busy Midlands. Birmingham, once a struggling community "worth twenty shillings" at the time of the Domesday Book, is now the largest provincial city in Great Britain, engaged in more than 1,500 trades including the manufacture of cars, cycles and electrical goods for the markets of the World. World trade means transport and today that means air transport. Fast travel for businessmen, fast carriage for freight. That is why Birmingham is airminded and has had an airport for more than twenty years.

How has the airport developed?
It began as a Corporation enterprise, opened by H.R.H. The Duchess of Kent, on July 8, 1939. Two months later it was requisitioned by the Air Ministry and used throughout the war as an EFTS and flight testing and delivery base for Stirlings and Lancasters. After the war, control was transferred to the Ministry of Civil Aviation, and civil flying began again on July 8, 1946. As a result of representations made by the local authorities the first scheduled air service from Birmingham to the Continent was flown on April 8, 1949. By 1951 regular services were operating to Paris, Dublin, Belfast, Jersey, Guernsey and Dinard. Nine years later, on April 1, 1960, the airport reverted to the control of the City Corporation.

And what's doing there today?
Eight airlines operate scheduled services to some 13 cities and towns in the U.K. and Europe. Seasonal and inclusive tour services are flown to another 20 cities and holiday resorts. Traffic is increasing fast and the potential growth is impressive. And at Birmingham Esso service is ideally suited to these conditions, with a compact modern installation geared to meet the current demand but ready for rapid expansion with all the resources of Esso's vast servicing organisation at its command. Resources which range from intangibles such as long experience, original thinking and an eagerness to serve, to material aspects such as up-to-the-minute plant and equipment whether it is a matter of a newly-invented Hydrafueller or a newly-opened refinery as shown below.

What has this to do with Birmingham?
This is the new Esso refinery at Milford Haven, opened by H.R.H. The Duke of Edinburgh, on November 4, 1960. Built at a cost of nearly £20 million, it supplements Esso's mighty £70 million installation at Fawley, and a considerable proportion of its initial capacity of some 4,500,000 tons annually will consist of aviation fuel. This is one of the latest examples of Esso's resources which ensure that at Birmingham Airport, as elsewhere, Esso will remain two steps ahead of current demand, however great the rate of expansion.

What are the chances of expansion at Birmingham?
This graph shows that already there is a significant increase in traffic.



Notice that in 1960 compared with 1959 the number of passengers increased by 50% and freight by 100%. This is the beginning of the upward trend and future prospects are bright, with Birmingham as a principal 'bus-stop' on the high-frequency internal routes, with helicopters linking city centres direct, with the rapid growth of executive flying and, most important of all in this centre of international commerce, with an ever-increasing flow of air freight that already has necessitated new premises for its handling.

And how will Birmingham deal with this demand?
A new passenger handling building for continental traffic was opened by H.R.H. The Duchess of Kent, on April 28, and extensive alterations to the existing terminal are in hand. The main runway has been extended and will be extended again to keep abreast of latest requirements. And as for helicopters, proposals are being considered for landing stations to be located in the city centre, for example over Snow Hill railway station. But with all these developments one factor will never change — the need for fast turn-round, never more vital than at a busy airport handling short-haul traffic — commercial traffic, where time means money with a vengeance. And this is where Esso scores, with safe, swift service backed by thorough training and vast resources which mean time and money saved.

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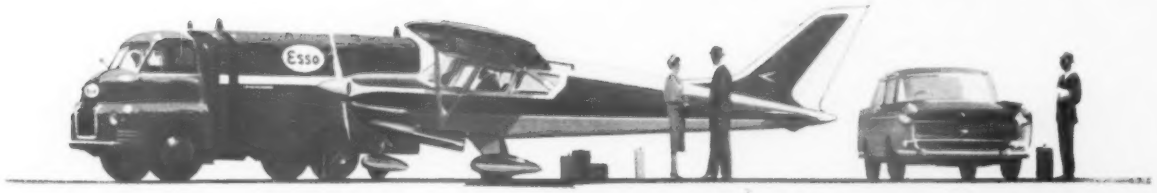
A BEAGLE — Auster AIREDALE at Birmingham. More business aircraft in Britain mean closer personal ties and faster communications with markets overseas, with Esso providing safe service fast wherever the British businessman flies.



The heart of England is in touch with the heart of Holland . . . and of Belgium . . . and of France . . . Brisk turn-round at Birmingham is vital to the airlines with passengers whose sole reason for flying is to gain a few, valuable extra hours at their destinations.

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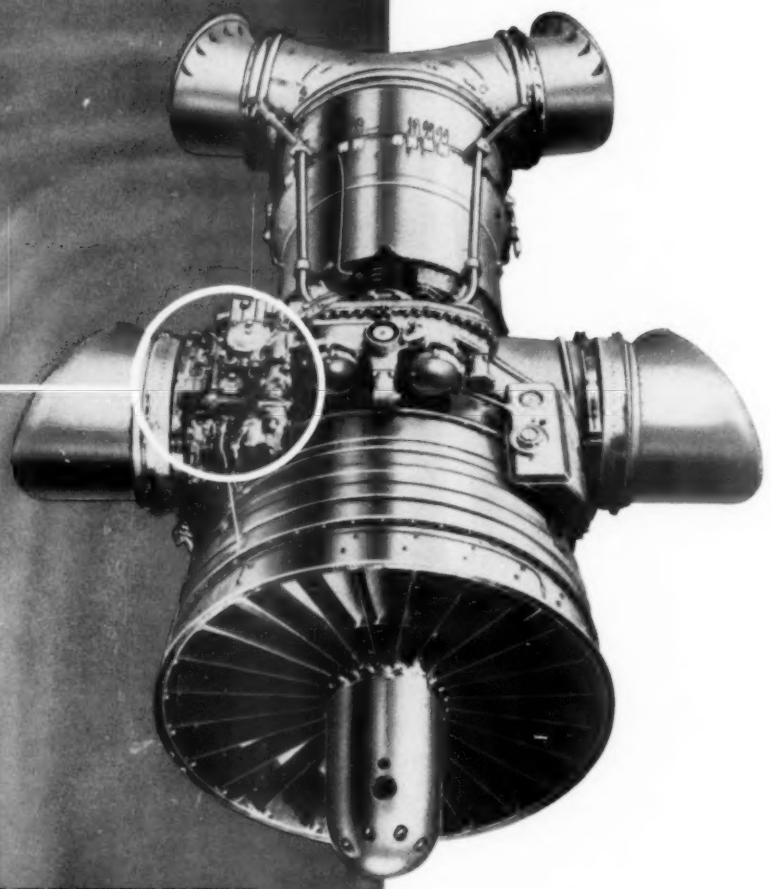

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Airlines of the World . . . .

AMERICA (Central & South)—

Brazil (contd.)

Paraense, Transportes Aereos, S.A.—Rua 13 de Maio 100/102, Belem.

This carrier operates services locally and to Brasilia and Rio de Janeiro.

AIRCRAFT: C-46.

MANAGEMENT: President, A. Ramos; director, F. de Barros.

REAL-Aerovias Brasilia-Nacional.—Rua Conselheiro Crispiniano 379, Sao Paulo.

Founded in 1946, REAL took over the control of Aerovias Brasil and Aeronorte in 1954. In 1956 REAL-Aerovias took over Nacional Transportes. A large domestic network is operated by the consortium and external services are flown to Uruguay, Paraguay, Argentina, Venezuela and Trinidad. Varig (which see) now controls the REAL services to the U.S.A. and Japan.

AIRCRAFT (March, 1961): 4 L-1049H, 5 Electra, 12 Convair 440, 5 Convair 340, 11 C-46, 51 DC-3; on order, 3 Convair 990.

MANAGEMENT: President, Linneu Gomes. Directors: operations, Capts. J. B. Damasceno and Armando A. Campos; traffic, Capts. Ary Flemming and Omar Fontana; administration Dr. Joaquin Peixoto Rocha.

Sadia S.A. Transportes Aereos.—Rua Sao Bento 470, Sao Paulo.

A unit in the REAL consortium, Sadia operates domestically from Sao Paulo.

AIRCRAFT: 2 DC-3, 2 C-46.

Erechim. Crews and technical assistance are supplied by Cruzeiro which is a majority shareholder. It was founded in 1946.

AIRCRAFT (March, 1961): 2 DC-3.

MANAGEMENT: President, E. C. Becker; vice-president, V. V. de Fonesca; operations manager, T. Fruet.

Servicos Aereos Cruzeiro do Sul, Ltda. (Cruzeiro).—Avenida Rio Branco 128 (P.O.B. 190), Rio de Janeiro.

Successor to the German Condor Syndikat, which was established in 1926. Cruzeiro has been wholly Brazilian-owned since 1941, when, with private capital, it was renamed Servicos Aereos Condor. The present name was adopted on nationalization and reorganization in 1942. In addition to a domestic network, services are flown to British and French Guiana and Argentina.

AIRCRAFT (March, 1961): 29 DC-3, 4 Convair 440, 14 Convair 240/340, 7 C-82.

MANAGEMENT: President, Dr. Jose Bento Ribeiro Dantas; superintendent, Dr. L. Cardoso de Amorim Filho. Directors: J. Quintino Vieira de Carvalho; Dr. Eurico de Freitas Valle; Brig. Franklin A. Rocha; Dr. Murillo S. Pacheco; Dr. Carlos Emmanuel de Silva; Otto Breyer; Oswald Mueller.

Taxi Aereo de Santander.—P.O.B. 384, Sao Luiz, Maranhao.

The company flies local services from Sao Luiz.

AIRCRAFT: 3 DC-3, 2 D.H.C. Beaver, 1 Stinson, 4 D.H. Rapide, 2 Cessna 180.

Transportes Aereos Salvador.—8 Avenida Ioana Angelica, Salvador, Bahia.

Operates local services from Salvador.

AIRCRAFT (March, 1961): 3 DC-3, 8 C-46.

Viacao Aerea Sao Paulo S.A. (VASP).—Rua Libero Badaro 89, Sao Paulo.

VASP operates a shuttle service between Rio de Janeiro and Sao Paulo and to various points in Brazil. It was formed in 1934, started operations in 1935, and is locally owned.

AIRCRAFT (March, 1961): 13 DC-3, 15 Scandia, 5 Viscount 827.

MANAGEMENT: President, Brig. Oswaldo Pamplona Pinto; vice-president, Dr. Marcello de Camargo Vidigal; exec. director, Alfredo de Salles Oliveira Netto.

One of Cruzeiro do Sul's Convair 440s at Sao Paulo.

S.A. Empresa de Viacao Aerea Rio Grandense (Varig).—Avenida Borges de Medeiros (P.O.B. 243), Porto Alegre.

Varig was founded in 1927 and is the oldest airline in Brazil. It is 85% employee-owned, with a State holding of 5% of the capital. Following a recent reorganization of plans for Brazilian international operations, Varig now controls REAL's trunk international services. In addition to a considerable domestic network, Varig operates to New York, Montevideo, Buenos Aires, Ciudad Trujillo and (as Aerovias Brasil-Varig) to Mexico, the U.S. west coast and Japan.

AIRCRAFT (March, 1961): 12 Convair 240, 20 DC-3, 13 C-46, 5 L-1049G, 2 Boeing 707-420, 2 Caravelle (now one).

MANAGEMENT: President, Ruben M. Berta. Vice-presidents, Ruben Bordini; International Division, Walter Heuer; North Division, Erik de Carvalho; South Division, Harry Schuetz. Director - superintendents: South Division, Rudy Schaly; North Division, Helio Smidt. Directors: Traffic, José Rochedo; maintenance, Goetz Herzfeldt; operations, L. Souza Pinto; tele-communications, Erni Peixoto; accounting, Lauro Zerwes.

Sociedade Aronima Viacao Aerea Gaucha (SAVAG).—Edifico Camara de Comercio, Rio Grande, Rio Grande do Sul.

SAVAG operates between Rio Grande, Porto Alegre, Bage and

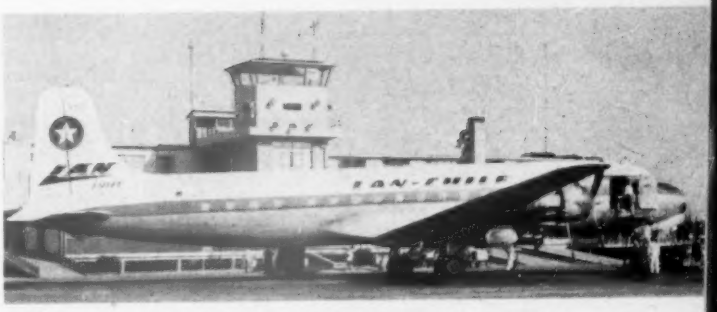
BRITISH GUIANA

British Guiana Airways (Government), 32 Main St. (P.O.B. 102), Georgetown.

Founded in 1939 by Maj. A. J. Williams. B.G.A. operates locally within British Guiana and to the West Indian islands. In 1955 the Government took over control and B.W.I.A. manages the operations.

AIRCRAFT (March, 1961): 3 DC-3, 3 Goose G-21A.

MANAGEMENT: General manager, Capt. J. M. Farquharson; technical manager, H. E. Wendt; engineering supt., S. H. Kennard.



Lan Chile has seven DC-6Bs, one of which is seen here at Los Cerrillos Airport, Santiago.

BRITISH HONDURAS

British Honduras Airways.—7 Cork Street (P.O.B. 186), Fort George, Belize.

Previously known as British Colonial Airlines, B.H.A. was formed in 1952. It is a wholly owned subsidiary of B.W.I.A. and does not at present operate scheduled services.

AIRCRAFT: 4 Cessna 170/180.

MANAGEMENT: President, John L. Freiberg; vice-presidents, H. A. Freiberg, Jnr., R. H. Eyles and T. S. Baker (manager).

CHILE

Lan-Chile Airlines.—Los Cerrillos Airport, Santiago.

LAN (previously Linéa Aérea Nacional) was founded in 1929 by Government and operates domestic service from Arica to Magallanes and to Argentina, Uruguay, Perú, Bolivia, Panamá and the U.S.A. (Miami).

AIRCRAFT (mid-1961): 7 DC-6B, 4 Convair 440, 4 Martin 202, 15 DC-3, 1 Cessna 303.

MANAGEMENT: Vice-president, Mauricio Yánquez; general secretary, Renato Rioseco; operations manager, Jorge Jarpa; commercial manager, Héctor Sauvageot; public relations manager, Luis González.

Linea Aérea del Cobre, Ltda. (Ladeco).—Amunátegui 73, Santiago.

Ladeco was formed in 1958. It is privately owned and operates daily services to the northern part of Chile, mainly between the copper-mining centres and Santiago.

AIRCRAFT (March, 1961): 2 DC-3.

MANAGEMENT: Manager, Juan Costabal; assistant manager, Jorge Figueroa; chief of maintenance, Jaime Cáceres; chief of operations, Félix Río.

COLOMBIA

Aerotaxi.—Carrera 9a, No. 16-51, 7th Floor, Bogota.

Operates a series of "bush" schedules to and from points between San Juan de Arama and Arauquita.

AIRCRAFT: D.H.C. Beaver.

Aerovias Nacionales de Colombia S.A. (Avianca).—Carrera 7a, No. 16-14, Bogota.

Avianca is the oldest airline in the Americas; its predecessor, SCADTA, was formed in 1919. Pan American obtained a major interest in 1930; it was partly nationalized and given its present name in 1940. Avianca operates to Miami, New York, Jamaica, Puerto Rico, Panama, Venezuela, Peru, Ecuador and to Europe.

AIRCRAFT: 2 Boeing 720B, 3 L-1049G, 4 L-749, 12 DC-4, 23 DC-3, 15 D.H.C. Beaver, 4 Cessna, 23 helicopters.

MANAGEMENT: President, Juan Pablo Ortega; exec. vice-president, Sabas Pretelt; technical vice-president, Rafael Barvo G.; commercial vice-president, Herbert Wild; asst. to president, Cor. Herbert Boy.

Lloyd Aereo Colombiano, S.A.—Avenida Jimenez No. 5-57 (P.O.B. 4904), Bogotá.

Formed in 1954, Lloesa started operations with three C-46s. Services are operated to Barranquilla, Cartagena, Medellin, Cali y Periera and Miami.

AIRCRAFT: 3 C-46, 1 DC-3.

MANAGEMENT: President and general manager, Col. Roberto Esguerra; general traffic and sales manager, Jorge Chaves; administrative manager, Fernando Monroy; operations manager, Capt. Pedro Florez.

"RAS," Rutas Aereas de Colombia, Ltda.—Parque de Berrio, Edificio del Cafe, Medellin.

Formed in 1955, RAS first operated domestic services to build up feeder lines for an international network. The first external service was flown between Bogotá and Curacao (Neth. Antilles) with DC-4s. In 1956 RAS was operating to Panama and Miami; in 1958 to Rio, via Manaos; and in 1959 to Mexico City.

AIRCRAFT (March, 1961): 3 DC-4, 2 DC-3, 3 DC-6B.

MANAGEMENT: President, Dr. Joaquin Londoño; technical director, Capt. K. J. Rüpplin von Keffikon; financial and admin. director, J. B. Constandse; manager, traffic and sales, A. Leeuwin; manager, operations, S. M. Claessens.

Sociedad Aeronautica Medellin S.A. (SAM).—Apartado Aereo 1085, Medellin.

Operates between Cali, Bogotá, Medellin, Cartagena and intervening points.

AIRCRAFT: DC-4, C-46.

COSTA RICA

Lineas Aereas Costarricenses S.A. (LACSA).—Avenida 1a, Calle 3a (Apartado 1531), San José.

LACSA was founded in October, 1945, in affiliation with Pan American. There is a 33.3% Government participation. It serves points in Costa Rica, with external services to Miami, Cuba, Cayman, Mexico and Panama.

AIRCRAFT (mid-1961): 1 DC-3, 4 C-46, 1 Convair 340, 1 DC-6B.

MANAGEMENT: President, Dr. Antonio Peña Chavarria; general manager, Otto Escalante; asst. general managers, Ricardo Pacheco and José Antonio Ardón; traffic/sales manager, Manuel Alvarado; operations manager, Carlos Holst.

CUBA

Aerovias "Q." S.A.—Prado 252, Havana.

Formed in 1945, "Q" Airways is not at present operating international services.

AIRCRAFT (March, 1961): 3 DC-4, 3 C-46.

MANAGEMENT: General comptroller, Humberto Armada; general manager, Roberto Cendoya.

Cia Cubana de Aviacion, S.A.—Aeropuerto José Marti, Rancho Boyeros, Havana.

Starting as a local carrier in 1930 with Ford Trimotors, Cubana began international operations in 1946 with a service to Miami. Using DC-4s, transatlantic services to Madrid were inaugurated in 1948, and services to New York in 1956 with L-1049Gs. P.A.A. was a shareholder until 1954 when Cubana became an entirely national enterprise.

AIRCRAFT (March, 1961): 3 Britannia 318, 3 L-1049G, 3 Viscount 818, 5 DC-3A; now also operating Il-14s.

MANAGEMENT: President and general manager, L. M. Menocal; vice-president, Fransisco Garcia; operations manager, César Alarcón.

Airlines of the World . . . .

AMERICA (Central & South)—

DOMINICAN REPUBLIC

Compañía Dominicana de Aviacion, C. por A.—Trujillo Airport.

Formed in 1944 by local interests and by Pan American, this company operates services to San Juan (Puerto Rico) and Miami, Fla.

AIRCRAFT (mid-1961): 2 DC-4, 1 DC-3, 4 C-46.

MANAGEMENT: President, C. A. McLaughlin; general manager, E. C. Haeger, Jr.

DUTCH GUIANA

Surinaamse Luchtvaart Maatschappij, N.V. (Surinam Airways).—P.O.B. 1029, Paramaribo.

Government-owned but commercially operated, Surinam Airways started services in 1955. Schedules are flown within Surinam and charter flights to adjoining countries.

AIRCRAFT: 1 Aero Commander, 2 Piper Apache, 3 Cessna UC-78.

MANAGEMENT: Manager, N. J. R. Zaal.

ECUADOR

"Area," Aerovias Ecuatorianas C.A.—Calle Bolivar 318, Quito.

Formed in 1948, Area first operated freight services with a C-46 between Ecuador and the U.S.A. and domestically. International services were suspended in 1954, when the present management took over, and the domestic network was consolidated.

AIRCRAFT (March, 1961): 2 DC-3.

MANAGEMENT: President, Capt. Luis Arias; general manager, Capt. Agustin Arias; asst. manager, Capt. Gerardo Arias.

Ecuatoriana de Aviacion, S.A.—Oficina 32, Pasaje Amador B-7, Quito.

Ecuatoriana was formed in 1957. It operates services over the route Miami-Panama-Cali-Quito-Guayaquil-Lima-Santiago.

AIRCRAFT: 2 C-46.

MANAGEMENT: President, Dr. Marco Tulio Gonzales; vice-president, Simón David Zevallos; operations manager, Maj. Alfredo Arteaga; traffic manager, Marcelo Burbano.

Linea Internacional Aerea, S.A.—456 V. M. Rendon, Guayaquil.

Operates between Quito and Guayaquil. No other information.

FRENCH GUIANA

Société Aérienne de Transports Guyane-Antilles.—Rochambeau Aerodrome, Cayenne.

SATGA was formed in 1949. Regular services are operated from Cayenne to six points within French Guiana.

AIRCRAFT: 3 D.H. Rapide, 2 Cessna UC-78.

MANAGEMENT: Manager, C. D. Peru-Dumesnil.

GUATEMALA

Empresa Guatemalteca de Aviacion (Aviateca).—Avenida Hincapie, Aurora Airport, Guatemala City.

Aviateca was founded in 1939 and reorganized in 1945 as a government-owned undertaking. Scheduled passenger and freight services are flown domestically.

AIRCRAFT (Oct., 1961): 5 DC-3, 1 DC-6B, 1 DC-4, 1 C-46.

MANAGEMENT: President Col. Arturo Guirola Batres; operations manager, Col. Alfredo Castañeda D.

HAITI

Cie Haitienne de Transports Aériens (Cohata d' Haiti).—Bowen Field, Port-au-Prince.

This military air transport organization was established in 1942. It operates services to the principal towns in the Republic.

AIRCRAFT (March, 1961): 2 DC-3, 1 Beech Expeditor.

MANAGEMENT: Commanding officer, Col. Georges Danache; asst. commandant, Lt.-Col. Yvon Boyer; operations manager, Lt.-Col. Pélissier Nicolas; sales manager, Capt. Frantz Lominy.

HONDURAS

Aerovias Nacionales de Honduras, S.A. (ANHSA).—Avenida Colon Y 4A Calle, Tegucigalpa.

Formed in 1950 by private interests; 84% of the stock was bought by SAHSA in 1957. It operates domestic services.

AIRCRAFT (mid-1961): 2 DC-3.

MANAGEMENT: President/general manager, Jorge A. Torres; treasurer-secretary, Isidoro Acosta Bonilla.

Servicio Aereo de Honduras, S.A. (SAHSA).—5a Avenida y 5a Calle, Tegucigalpa, D.C.

Founded by private interests and Pan American in 1945, operations were begun in that year. The company operates domestically within Honduras and to British Honduras, Guatemala, Salvador and Nicaragua. SAHSA acquired TACA de Honduras in 1953 and merged its routes and equipment.

AIRCRAFT (mid-1961): 5 DC-3, 2 C-46.

MANAGEMENT: President, José T. Mendoza; vice-president, Horton S. Kivett; general manager, Jorge A. Torres; treasurer, Ramiro Cabañas.

Transportes Aereo Nacionales, S.A. (TAN Airlines).—Edificio Marichal, Tegucigalpa.

This private company was formed in 1947 as a cargo carrier. Scheduled passenger operations were started in 1950. TAN's routes serve Miami, Cuba, El Salvador, Guatemala and British Honduras.

AIRCRAFT: 3 C-46.

MANAGEMENT: President, M. Brooks; vice-president, C. W. Shelton; secretary, R. Alvarez.

MEXICO

Aeronaves de Mexico, S.A.—Boulevard del Aeropuerto No. 161, Mexico City.

With a history going back to 1934, Aeronaves now operates throughout Mexico and to New York. Since 1941 Aeronaves has taken over a number of other operating companies, including Aerovias Reforma and Lineas Associadas Mexicanas.

AIRCRAFT: 10 DC-3, 2 C-47, 9 DC-6, 2 Britannia 302.

MANAGEMENT: General director, Ing. Jorge Pérez y Bouras. Assistant directors: Sales and traffic, Luis Frías Carrillo; financial, Andres Montero; technical, Ing. Ramón Pérez Morquecho.

Aero Transportes S.A. (ATSA).—Avenida Juarez, Mexico City.

Operates between Monterray and Matamoros.

AIRCRAFT: 1 DC-4 (leased from Mexicana).

Cia Mexicana de Aviacion, S.A.—Balderas No. 36 (Apartado Postal 901), Mexico D.F.

Mexicana was incorporated in 1924. Pan American, which took control in 1929, still retains a 42% interest. A domestic network is flown and international services are operated to Los Angeles, San Antonio (Texas), Chicago and Havana.

AIRCRAFT: 11 DC-3A, 4 DC-3, 5 DC-4, 8 DC-6, 5 C-82, 3 Comet 4C.

MANAGEMENT: President, Lic. Aarón Saénz; vice-president and treasurer, Pedro A. Chapa; secretary, Luis Latapí; general manager, H. Max Healey; legal director, Luis Andrade Pradillo; commercial director, Manuel Sosa de la Vega; technical director, Ing. Jesús Vargas; planning and development director, C. Niño de Rivera; finance manager, Mario Hernández Robles; operations manager, Arturo Jiménez Nieto; maintenance manager, Alonso Grab.

Guest Aerovias Mexico, S.A.—Paseo de la Reforma 51, Mexico City.

Founded by Winston Guest in 1946, this company operated an intercontinental service to Madrid in 1948-49 and now operates again to Lisbon, Madrid and Paris. Services are also operated to Miami and to Panama and Venezuela.

AIRCRAFT (March, 1961): 3 DC-3, 1 DC-4, 2 L-749, 3 L-1049G, 1 C-82.

MANAGEMENT: President, Winston Guest; executive vice-president and general manager, G. L. Monteiro; general manager, traffic/sales, J. S. Nothnagel.

Lineas Aereas Unidas, S.A.—Izazaga 8-E, Mexico 1 D.F.

Operates between Mexico City and Cachahuatepec and to intervening points.

AIRCRAFT: 5 Canadair DC-4M.

Trans Mar de Cortes.—Calle Esquerro 30, Apartado Postal 149, La Paz, Baja California.

This company initiated freight and mail runs on a local basis in 1948. Passenger services were started a year later. In 1952 Lineas Aereos del Pacifico was acquired. Local services are operated.

AIRCRAFT (mid-1961): 3 DC-3, 1 F-27.

MANAGEMENT: Director-manager, Mayo Obregón Tapia; asst. manager and comptroller, Arnulfo García; operations manager, Thomás B. Lee; sales manager, Guillermo Escudero Luján, maintenance manager, Arturo Armas.

NICARAGUA

Lineas Aereos de Nicaragua, S.A.—Apartado Postal No. 753, Managua.

Pan American Airways holds a 40% interest in Lanica, which operates services throughout Nicaragua. It was formed in 1945.

AIRCRAFT (March, 1961): 1 Viscount, 7 DC-3, 2 C-46.

MANAGEMENT: President, Col. L. A. Somoza.

PANAMA

Aerovias Panama Airways.—Calle B. No. 1, El Cangrejo (P.O.B. 4308), Panama City.

The predecessor of this company was founded in 1951 as a cargo and passenger carrier. It operates, in conjunction with Ecuatoriana, between Miami, Panama, Colombia, Ecuador and Peru.

AIRCRAFT (March, 1961): 1 DC-6, 1 DC-4, 2 C-46.

MANAGEMENT: General manager, C. R. Howell; supt., maintenance and operations, D. B. Sittman; comptroller, A. D. Susi; general traffic and sales manager, J. D. Sotis.

Cia Panamena de Aviacion, S.A.—25 Avenida Peru, Panama City.

Copa was founded in 1946 and operates domestically and to San José, Costa Rica.

AIRCRAFT: 2 DC-3, 2 C-46.

MANAGEMENT: President, Dr. Carlos Icaza; secretary, Camilo Quelqueju; general manager, Emilio F. Clare.

PARAGUAY

Lloyd Aereo Paraguayo, S.A. (LAPSA).—Edif. Victoria, 1°P. Oficinas Nos. 17/18/19, Calles Chile y Oliva, Asunción.

Established in September, 1960, LAPSA started operations on May 24 this year over the Asunción-Curitiba-Sao Paulo/Rio de Janeiro route. Services to Montevideo and Buenos Aires are planned.

AIRCRAFT: 2 C-46F.

MANAGEMENT: Managing director, Rubens Medina Alborno; technical manager and representative for Brazil, Manoel Guerra Borges; commercial manager, J. Rolando Silva Barboza.

PERU

Aerolineas Peruanas, S.A.—Nicolas de Pierola 700, Lima.

This carrier operates between Lima, Santiago and Buenos Aires.

AIRCRAFT: (March, 1961): 2 DC-6B, 2 DC-3, 1 C-46.

Cia de Aviacion "Faucett," S.A.—Jirón Unión 926 (Hotel Bolivar Building) Lima.

Established in 1928 by the late Elmer J. Faucett, this is one of the oldest airlines in Latin America. Services are flown to the main centres in Peru. A DC-6B service to Miami is planned for this year.

AIRCRAFT (mid-1961): 4 Stinson-Faucett, 7 C-47, 4 DC-3, 4 DC-4, 1 DC-6B.

MANAGEMENT: President, Eduardo Dibós; managing director, Antonio Bentin.

PUERTO RICO

Caribbean Atlantic Airlines, Inc.—P.O.B. 6035, Loiza Station, Santurce.

Incorporated in 1939, Caribair operates from San Juan to Ponce, Mayaguez, the Virgin Islands, St. Martin and Dominica. The Transportation Corporation of America (owners of Trans-Caribbean Airways) has recently bought a 16% interest in Caribair.

AIRCRAFT (mid-1961): 7 DC-3.

MANAGEMENT: President: D. Trigo; vice-president, B. Trigo; vice-president operations, J. M. Sierra; treasurer, L. A. Lockhart; secretary, Jose Gonzalez; vice-president, traffic, R. B. Forrest.

SALVADOR

TACA International Airlines, S.A. P.O.B. 428, Kenner (New Orleans), Louisiana, U.S.A.

TACA operates passenger and cargo services from New Orleans to Belize, Guatemala City, San Salvador, Tegucigalpa, Managua, San José and Panama. It was formed in 1939 by the TACA Corporation.

AIRCRAFT (mid-1961): 2 Viscount 786, 2 DC-4.

MANAGEMENT: President, Ricardo H. Kriete; exec. vice-president, Enrique Sol; vice-president, general manager, W. B. Daly; vice-president, traffic and sales, G. J. McHugh; treasurer, J. W. Morgan, Jr.; vice-president, operations, C. E. Taylor.

URUGUAY

Cia Aeronautica Uruguaya, S.A. (CAUSA).—San José 1156, Montevideo.

Formed in 1936, and starting with Ju-52 floatplanes, CAUSA operates flying-boat services between Colonia and Montevideo and Buenos Aires.

AIRCRAFT (March, 1961): 3 Sandringham.

MANAGEMENT: President, J. A. Beisso; managing director, T. L. Borges; secretary, O. M. Rodriguez.

Primeras Lineas Uruguayas de Navegacion Aerea (PLUNA).—Colonia 1021, Montevideo.

PLUNA began operations in 1936; it was reorganized in 1944 as a "mixed economy" company—83% Government and 17% private interests. Since 1951 it has been entirely Government owned. It

The first of two Convair 880-M for VIASA, the new Venezuelan international carrier.

operates domestically and internationally to Argentina, Paraguay and Brazil.

AIRCRAFT (mid-1961): 6 DC-3, 3 Viscount 769D.

MANAGEMENT: President, Silvestre O. Landoni; vice-president, Tte. Col. A. Prego Alonso; general manager, Roberto Langón Balparda; vice-gen. mgr., J. Oliver de la Torre; inspector general, Mario M. Artagaveytia; finance manager, J. Abelardo Garcete; commercial manager, Domingo Tassino; technical manager, Eng. Jaime Coll; flight operations manager, Omar Darriulat; planning adviser, Alberto Márquez Vaeza; secretary of the Board, Raúl E. Adami.

VENEZUELA

Aerovias Venezolanas, S.A. (Avensa).—Apartado de Correos No. 943, Caracas.

Avensa was founded in 1943, 30% of the capital being owned by Pan American and 70% by Venezuelan citizens. Services cover a large domestic network and international services are operated to Montego Bay (Jamaica), Miami and New Orleans.

AIRCRAFT (mid-1961): 10 DC-3, 3 C-46, 5 Convair 340, 2 Convair 400, 5 F-27, 2 DC-6B.

MANAGEMENT: President, H. L. Boulton; act. president and general manager, A. Boulton; exec. vice-president, Henry L. Boulton, Jr. Vice-presidents: Asst. to president, Capt. G. O. Tucker; R. van den Branden; A. Pena. Chief accountant, Joaquin Saiz; operations manager, Capt. Harry Gibson; chief pilot, Capt. M. Carbonell; traffic and sales manager, A. Carvello Ganteaume.

Linea Aeropostal Venezolana.—Bloque 1, El Silencio, Caracas.

Formed in 1926, L.A.V. is Government-owned. Earlier this year Venezuela's long-haul services were taken over by a new company, VIASA (see below), but L.A.V. continues to operate domestically and to Trinidad, Curaçao and Bogota.

AIRCRAFT: 5 L-1049G, 3 Viscount 749, 2 Martin 202, 18 DC-3, 4 C-46.

Ransa Airlines (Rutas Aereas Nacionales, S.A.).—Edificio America 407, Caracas.

Founded in 1948, Ransa is an all-cargo carrier operating between Miami, Jamaica and Venezuela.

AIRCRAFT: 2 DC-6A, 13 C-46.

MANAGEMENT: President, C. Chaves; general manager, E. Pardey; operations manager, R. D. Borges.

Venezolana Internacional de Aviation, S.A. (VIASA).—Edificio Dr. Paul A. la Marron, Apartado 6857, Caracas.

VIASA, which started operations on April 6 this year, is the new international flag carrier of Venezuela and is taking over all the international operations of L.A.V. (formed in 1926) and Avensa. Long-haul services are being flown with DC-8s by K.L.M., which has been giving VIASA operational, technical and commercial assistance. The Venezuelan Government holds 55% of the capital; the remainder is held by L.A.V., Avensa and private interests.

AIRCRAFT: 2 Convair 880-22M.

MANAGEMENT: President, Dr. O. M. Zuloaga; general manager, Capt. G. O. Tucker; asst. to president, R. van den Branden.

WEST INDIES

British West Indian Airways, Ltd.—Kent House, Maraval, Trinidad.

B.W.I.A. was formed in 1948 and was the successor to one which had operated since 1942. Until this month (when 90% of the shareholding is being taken over by the Trinidad Government) it has been wholly owned by B.O.A.C. but operates as an independent unit. Points serviced include Bermuda, Jamaica, Puerto Rico, Barbados, Venezuela, British Guiana, British Honduras, Leeward and Windward Islands, Miami and New York, and London.

AIRCRAFT (mid-1961): 3 D.C.3, 5 Viscount; Britannias and 707s on charter from B.O.A.C.

MANAGEMENT: Managing director, D. H. Glover; general manager, John H. Rahr; asst. to general manager (technical), Capt. P. W. Kelshall; general sales manager, Basil F. Pantin; act. industrial relations adviser, C. Payne; manager, stations and traffic, Walter Girling; chief accountant, C. Headley; chief inspector, G. Sheppard; act. maintenance and overhaul supt., E. Pinard; supplies supt., A. Achong; manager, Trinidad, P. Habib; economics officer, W. Sapey.

Leeward Islands Air Transport Services, Ltd.—Plymouth, Montserrat.

This company was formed in 1956 to provide local services among the chain of islands between Anguilla, Antigua, Grenada, Barbados and Trinidad. In 1959 the services of the St. Vincent Government Air Services were taken over. B.W.I.A. has held 51% of the shares.

AIRCRAFT: 2 D.H. Heron, 2 Beech Twin Bonanza, 1 Piper Apache.

MANAGEMENT (directors): F. S. Delisle (managing); Sir Errol L. Dos Santos; John H. Rahr; Henry J. Kimelman; Air Cdre. G. Powell.

ASIA

ADEN

Aden Airways, Ltd.—Khormaksar, Aden, Arabia.

This company is owned by B.O.A.C. Associated Companies and took over the Cairo-based operations of the Corporation when it was formed in 1949. Aden Airways' more important route points are Nairobi, Mombasa, Bahrein, Asmara, Hargeisa (Somaliland), Djibouti and Khartoum.

AIRCRAFT: 7 DC-3, 3 Canadair Argonauts; on order, 3 Avro 748.

MANAGEMENT: General manager, D. F. Classey; chief engineer, G. G. Farnsworth; dep. regional manager and operations manager, Capt. W. Burman; sales manager, H. L. Sikka; secretary/chief accountant, G. Morello; staff admin. supt., F. Goodwin.

AFGHANISTAN

Ariana Afghan Airlines Co., Ltd.—Jadde-Maiwani (P.O.B. 76), Kabul.

This, the national airline of Afghanistan, was formed in 1955. It is owned 51% by various Afghan banks and Government institutions and 49% by Pan American. It operates domestic services to major points in Afghanistan and international services to Delhi, Amritsar, Karachi, Bahrein, Teheran, Damascus, Beirut, Ankara, Prague and Frankfurt.

AIRCRAFT: 1 DC-6B, 1 DC-4, 4 DC-3.

MANAGEMENT: President, Faiz Mohamed Ahmedzai; vice-president, L. C. Lindsey; comptroller, Biarne V. Ferdinansen; secretary, Mohamed Aslam; operations manager, William L. Wallace; traffic and sales manager, F. S. Adams.

BORNEO

Borneo Airways, Ltd.—P.O.B. 33, Labuan, British North Borneo.

This company was formed in 1957; the three British Borneo Governments (Sarawak, Brunei and N. Borneo) hold 51% of the shares, and B.O.A.C. (A.C.) and Malayan Airways hold 49%. Its function is to develop British Borneo, to provide services complementary to those of Malayan Airways and to provide a feeder to Cathay Pacific.

AIRCRAFT: 3 Scottish Twin Pioneers.

MANAGEMENT: Chairman, D. E. M. Fiennes; manager, Capt. T. M. Robertson; commercial supt., J. McLean; secretary/accountant, M. G. Lyons; chief pilot, Capt. R. H. A. Nicholls; chief engineer, S. L. Hempell.

One of C.A.A.C.'s Il-14s at Mingaladon Airport, Rangoon, in July this year.

BURMA

Union of Burma Airways Board.—104 Strand Road, Rangoon.

The formation of U.B.A.B. followed the Nationalization of Air Transport Order of 1948, the Union of Burma Airways Order of 1950 and the Act of 1953 under which the Board was twice reconstituted. Services are operated to points within Burma and Bangkok (Thailand), Calcutta and Chittagong (East Pakistan).

AIRCRAFT: 8 DC-3 (1 C-47, 3 C-47A, 4 C-47B), 3 Viscount 700D.

MANAGEMENT: Chairman, Thiri Pyan Chi, Sithu U Ba Kyaw; general manager, U Taw; commercial manager, U Pe Tint; engineering manager, U Tha Mg Chit; operations manager, Capt. Khin Mg Latt; admin. officer, U Soe Aung; chief accountant, U Mg Mg Ohn; chief inspector, R. A. Woodworth; sales supt., U Mg Mg; traffic supt., U Khin Mg Aye.

CAMBODIA

Royal Air Cambodge.—151 Vithei Dekcho Damdin (P.O.B. 539), Phnom-Penh.

The Cambodian national airline started operations in 1956, and flies services to Saigon, Thailand and Hong Kong (with Boeing 707 chartered from Air France).

AIRCRAFT (March, 1961): 1 L-1049G, 1 DC-3.

MANAGEMENT: Chairman, Huot Sam Ath; general manager, Jean Florent.

CEYLON

Air Ceylon, Ltd.—Air Ceylon Building, York Street, Fort, Colombo 1.

In 1951 Air Ceylon, which had been operating since 1947, became a corporation, the participants being the Government and Australian National Airways. K.L.M. became a partner in 1956, replacing A.N.A. B.O.A.C. has recently agreed to take over the long-haul operations.

AIRCRAFT (March, 1961): 2 DC-3.

MANAGEMENT: Managing director, J. L. M. Fernando; accountant, F. B. W. Goonawardena; engineering manager and chief engineer, W. A. E. Molamure; operations manager and chief pilot, Capt. S. J. P. Fernando.

CHINA

Civil Aviation Administration of China.—15 Chang-an Street (East), Peking.

C.A.A.C. succeeded Skoga in 1954 when Soviet participation ceased, though services are still flown in co-operation with Aeroflot. It operates over a domestic network and to Ulan-Bator, Irkutsk, Mandalay, Rangoon, Hanoi, Vietnam, and into Tibet and North Korea.

AIRCRAFT: Il-18, Il-14, Il-12, Li-2.

FORMOSA (TAIWAN)

Civil Air Transport Company, Ltd.—46 Chung Shan Road North, 2nd. Section, Taipei.

Formed in March, 1955, this is a Nationalist China carrier of which the majority shareholding and effective control is held by Chinese nationals. Operations (now including the "Mandarin Jet" services with Convair 880s) cover routes within Taiwan and to Bangkok, Hong Kong, Okinawa, Osaka, Tokyo, Seoul and Manila.

AIRCRAFT: 1 Convair 880-M, 1 DC-6B, 1 DC-6A, 2 DC-4, 18 C-46, 5 DC-3, 2 Catalina, 2 Helio Courier, 1 Pell 47.

MANAGEMENT: Chairman, Dr. Wen-San Wang; managing director, Hugh L. Grundy; vice-president, traffic and sales, Var. M. Green.

HONG KONG

Cathay Pacific Airways, Ltd.—9 Connaught Road, Central, (P.O.B. 4), Hong Kong.

C.P.A. was formed in 1946 and reorganized in 1948, when John Swire and Sons, their associated shipping interests and A.N.A. secured 80% of the shares. In 1959 Hong Kong Airways was merged with C.P.A. and B.O.A.C.(A.C.) now holds 15% of the capital, the remainder being held by the C.P.A. and H.K.A. shareholders. Services are operated to Manila, Tokyo, Taipei, Osaka, Kyoto, Phnom-Penh, Vientiane, Saigon, Bangkok, Singapore, Kuala Lumpur, Rangoon, Calcutta and Brunei.

AIRCRAFT (mid-1961): 1 DC-6B, 1 DC-6, 1 DC-4, 2 Electra.

MANAGEMENT: Chairman, V. C. G. Knowles; managing director, J. H. Bremridge; commercial mgr., D. R. Y. Bluck; operations mgr., Capt. K. W. Steele; engineering director, J. T. Gething.

Civil Air Transport's Convair 880-M at Kai Tak Airport, Hong Kong.

Airlines of the World . . . .

INDIA

Air-India International Corporation.—New India Assurance Building, Mahatma Gandhi Road, Fort, Bombay 1.

Air-India was formed in 1948 with the Government of India holding 49% of the shares. Under the Air Corporations Act, it became a wholly Government-owned Corporation in 1953. It operates 707s to London, serving Cairo, Beirut, Rome, Geneva, Frankfurt, Prague and Paris; to New York; to Tokyo via Bangkok and Hong Kong; to Sydney via Singapore and Djakarta; to Nairobi via Aden; to Kuwait via Karachi and Bahrein; and to Moscow via Tashkent. It also operates a London-Bombay all-cargo service.

AIRCRAFT (August, 1961): 4 Boeing 707-437, 9 L-1049G (1 all-cargo); on order, 2 Boeing 707-437.

MANAGEMENT: Chairman, J. R. D. Tata; vice-chairman and general manager, B. R. Patel; commercial director, S. K. Kooka; financial controller, N. J. Pavri.

Indian Airlines Corporation.—Thapar House, Janpath, New Delhi.

Formed under the Air Corporations Act of 1953 and started operations on Aug. 1 that year, taking over all Indian domestic services. Operations are divided into three areas with centres and managers (responsible to head office) at Delhi, Bombay and Calcutta. The Corporation's network extends throughout India and into Afghanistan, West and East Pakistan, Nepal, Burma and Ceylon.

AIRCRAFT (mid-1961): 10 Viscount 768, 5 DC-4, 52 DC-3, 12 Viking, 7 D.H. Heron, 5 F-27; on order, 5 F-27.

MANAGEMENT: Chairman, V. Shankar; general manager, A.V.M. P. C. Lal, D.F.C.; financial comptroller, K. N. Kaul; chief operations and planning manager, Capt. J. M. Engineer; chief traffic manager, Biren Mukerji; engineering manager, T. D. Kumar; chief admin. manager, Brig. N. V. Bal; chief audit officer, Kripal Chand. Area managers: Capt. R. P. Huilgol (Delhi); Capt. D. A. Samant (Bombay); Dr. H. M. Wadia (Calcutta). Secretary to board, D. R. Kohli.

INDONESIA

Garuda Indonesian Airways, P.T.—Djalan Nusantara 15, Djakarta.

Successor to K.N.I.L.M. and K.L.M.'s Inter-Insular Division, Garuda was founded in 1950 as a mixed company with the Indonesian Government and K.L.M. as equal shareholders. In 1954 it was nationalized with K.L.M. providing technical assistance. Since February, 1958, it has been run entirely by Indonesian nationals. Garuda operates within Indonesia and internationally to Bangkok, Kuala Lumpur, Singapore and Manila.

AIRCRAFT: 3 Electra, 5 Convair 240, 8 Convair 340, 3 Convair 440, 18 DC-3, 13 D.H. Heron.

MANAGEMENT: President, Capt. Partono Parwitokoesoemo. Directors: operations, Capt. Soedarmo; commercial, Dr. S. A. Boerhanoedin; maintenance and engineering, Dr. Yap Kie Tik; administration, Usman Sidarta.

IRAQ

Iraqi Airways.—Iraqi Republic Railways, Baghdad West.

This airline was formed in 1945 as a subsidiary of Iraqi State Railways. Services were started the following year between Baghdad, Damascus and Beirut. Additional routes were subsequently opened to Kuwait, Bahrein, Teheran, Cairo, Mosul, Istanbul, Prague, Budapest, London and Delhi.

AIRCRAFT (mid-1961): 4 Viscount 735-773, 1 D.H. Dove.

MANAGEMENT: Director-general, Air Brig. Nassir Hussain El-Janabi; dep. director-general, Col. An'am Raouf; dep. director-general, technical, Capt. Ismail Fattah; commercial manager, Abdul Jabbar Ramadhan; flight captain, Jaweed Omer Draz; chief engineer, Sa'ad El-Chalabi.

ISRAEL

"Arkia" Israel Inland Airlines, Ltd.—42 Maze Street (P.O.B. 834), Tel-Aviv.

"Arkia" was founded in 1950 by El Al and the Jewish Federation of Labour to operate domestic services and special charters. Its main base is at Dov Airport.

AIRCRAFT (mid-1961): 5 DC-3, 1 D.H. Dove (on charter).

MANAGEMENT: Managing director, Jacob Hozman; general secretary, Itzhak Shander; technical manager, Lew Bigon; flight operations manager, Hagai Agmon.

El Al Israel Airlines, Ltd.—Lod Airport, Israel.

Formed in 1948, with 63% Government participation, El Al started flights between Israel and Paris in 1949. In 1950 services were extended in Europe to Athens, Rome, Vienna, Zurich and London, and in Africa to Nairobi and Johannesburg. In 1951 scheduled operations began between Tel-Aviv and New York, via various points in Europe. Services to Nicosia, Istanbul, Brussels, Amsterdam and Munich, and to Teheran, were added in the following years.

AIRCRAFT (mid-1961): 2 Boeing 707-420, 4 Britannia 313, 2 L-049; on order, 2 Boeing 720 B.

MANAGEMENT: Chairman and managing director, Brig-Gen. E. Ben-Arzi; exec. deputy managing director, Col. S. Lahat; divisional directors: commercial, M. Ben-Ari; finance and administration, D. Galezer; production and operations, K. Turin.

JAPAN

All Nippon Airways Co., Ltd.—3-1 Tamura-cho, Shiba, Minato-ku, Tokyo.

This airline was formed in 1952 and, in 1958, took over Far Eastern Airlines and Japan Helicopter and Airplane Transports Co. It operates over an extensive domestic network and internationally from Kagoshima to Naha (Okinawa). International services to Korea, Hong Kong and other points are planned.

AIRCRAFT (Sept., 1961): 3 Viscount 828, 3 F-27, 4 Convair 440, 13 DC-3, 2 D.H. Dove, 1 S-55, 13 Bell 47; on order, 3 Viscount 828, 7 F-27.

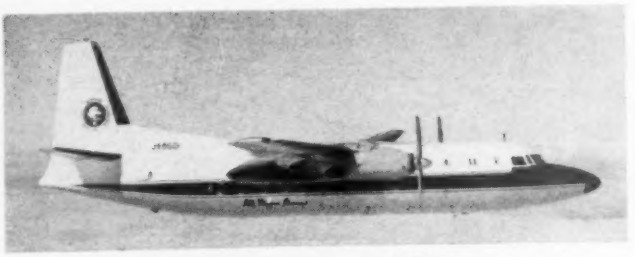
MANAGEMENT: President, M. Midoro; vice-president, K. Okasaki.

Japan Air Lines Co., Ltd.—Tokyo Building, 3 2-chome, Chiyoda-ku, Tokyo, Japan.

The original J.A.L. was formed in 1951 with Northwest Airlines providing equipment and flight crews for domestic services. The present company was formed in 1953 with the Government providing 50% of the capital. International services to the U.S. and Okinawa were started in 1954. J.A.L. now operates to the three U.S. West Coast gateway cities, to Okinawa, Taipei, Hong Kong, Bangkok, Singapore, Copenhagen, London, Paris and domestically. A service to Europe via India is planned for 1962.

AIRCRAFT (mid-1961): 4 DC-8, 2 DC-7C, 2 DC-7F, 5 DC-6B, 10 DC-4; on order, 1 DC-8, 5 Convair 880M.

MANAGEMENT: President, Shizuzia Matsuo; executive vice-president, Kambu Ishikawa; senior vice-president, Yoshito Kojima. Vice-presidents: sales administration, Ryohei Itow; operations administration, Tetsuo Oba; personnel, Kikue Urashima; economics and finances, Kinjiro Yuchi; general affairs, Benichi Akiyama; public relations and advertising, planning and research, Yasumoto Takagi.



The first of All Nippon Airways' 10 F-27s.

JORDAN

Jordanian (Jordan Airways).—Unrwa Building, Amman.

This company was registered last September following the Government's rationalization of the country's airlines. Its predecessor, Air Jordan of the Holy Land, was formed in 1958 as a successor to Air Jordan (formed in 1950 with Transocean Air Lines management and financial help) and Arab Airways (Jerusalem). The new company takes in Jordan International Airways and Jordan National Airways. The shareholdings are: Government 25%, M.E.A. 35%, private 40%. Regional operations have now been restarted with the help of M.E.A.

AIRCRAFT: 2 Viscount, 1 DC-3 (ex-M.E.A.).

KOREA (NORTH)

UKAMPS (Ministry of Communications of Korean Democratic Republic).—Prospekt Stalina, Pyongyang, Korean Democratic Republic.

Previously known as Sokao, services are flown in collaboration with Aeroflot. Sokao was founded in 1950. UKAMPS' services link up with those of Aeroflot.

AIRCRAFT: Il-14, Li-2.

KOREA (SOUTH)

Korean National Airlines.—No. 1, First Street, Chyong-no District, Seoul.

Formed by the Ministry of Transport in 1947, K.N.A. resumed operations in 1952. It now operates over a small domestic network and to Hong Kong.

AIRCRAFT (March, 1961): 1 L-749, 1 Convair 240, 1 DC-4, 3 DC-3.

MANAGEMENT: President, Y. W. Shinn; managing director, M. Kirk; chief engineer, M. McCormick.

LAOS

Air Laos Transports Aériens.—4, rue Manthathourath (ex Pierre Morin) (P.O.B. 87), Vientiane.

This company was formed in 1952 with 50% local private and 50% French airline capital (20% Air France, 30% Aigle Azur). It operates over domestic routes and to Saigon, Hong Kong, Bangkok and Phnom-Penh.

AIRCRAFT (March, 1961): 3 Boeing Stratoliner, 2 DC-3, 7 D.H.C. Beaver.

MANAGEMENT: President, H. H. Prince Souvanna Phouma; director-general, Bernard Apruzzese.

LEBANON

Air Liban.—Immeuble Esseily, Place Riad Solh (P.O.B. 1243), Beirut.

Formerly Compagnie Générale de Transports, Air Liban was founded in 1945 and operations started in 1946. The present name was adopted in 1951. Services are operated in Europe to Rome and Paris; in Africa to Khartoum, Kano, Lagos, Accra, Abidjan, Monrovia, Freetown, Dakar, Casablanca and Tripoli; and in the Near and Middle East to Cairo, Aleppo, Jerusalem, Nicosia, Jeddah, Kuwait and Dhahran.

AIRCRAFT: 1 Caravelle, 3 DC-6C, 1 DC-4, 3 DC-3; on order, 1 Caravelle.

MANAGEMENT: President and director general, Antoine Sehnaoui; commercial director, Jean Peyrondet; technical advisor, Victor Poirier.

Lebanese International Airways.—Zabbat Building, Justinien St., Beirut.

Starting scheduled services in 1956 with C-46s between Beirut and Kuwait, L.I.A. now operates to Dhahran, Teheran, Kuwait, Doha, Bahrein, Baghdad, Milan, Paris and Brussels.

AIRCRAFT (March, 1961): 1 DC-6, 2 DC-4, 1 York.

MANAGEMENT: President, A. Arida; vice-pres. and general mgr., C. Arida; commercial mgr., F. Nakhlé; admin. mgr., R. Melhem.

Middle East Airlines, S.A.—Beirut International Airport (P.O.B. 206), Beirut.

Formed in 1945 as a private enterprise, Pan American obtained 36% of the shareholding in 1949. In 1955 M.E.A. became an associate of B.O.A.C., which obtained 49% shareholding. In August, 1961, B.O.A.C.'s share was purchased by Lebanese nationals. M.E.A. operates to Istanbul, Athens, Rome, Vienna, Geneva, Frankfurt, London, Baghdad, Kuwait, Teheran, Jeddah, Dhahran, Bahrein, Aden, Doha, Karachi, Bombay, Nicosia, Ankara, Cairo, Jerusalem, Aleppo.

AIRCRAFT (mid-1961): 4 D.H. Comet 4C, 6 Viscount 754 (2 leased to Jordanian), 4 DC-3.

MANAGEMENT: Chairman and managing director, Sheikh Najib Alamuddin; exec. asst. managing director, Asad Y. Nasr; commercial controller, Col. Cyril Essely; controller of international affairs, Salim Salam; operations controller, Capt. R. W. Hornall; engineering controller, W. K. Forsyth. Assistant managing directors; commercial, Sami Mousfy; operations, Capt. J. Osborne; engineering, George Carayan. Planning and economics manager, Edmond Y. Asfour.

Trans-Mediterranean Airways S.A.L.—Murr Building, Hamra Street (P.O.B. 3018), Beirut.

T.M.A. was founded in 1953 by Munir Abu Haidar and became a Lebanese limited company in December, 1960. It operates regular freight

(*Continued on page* 611)

The terminal building at Beirut International with one of M.E.A.'s 4 Comet 4Cs in the foreground.

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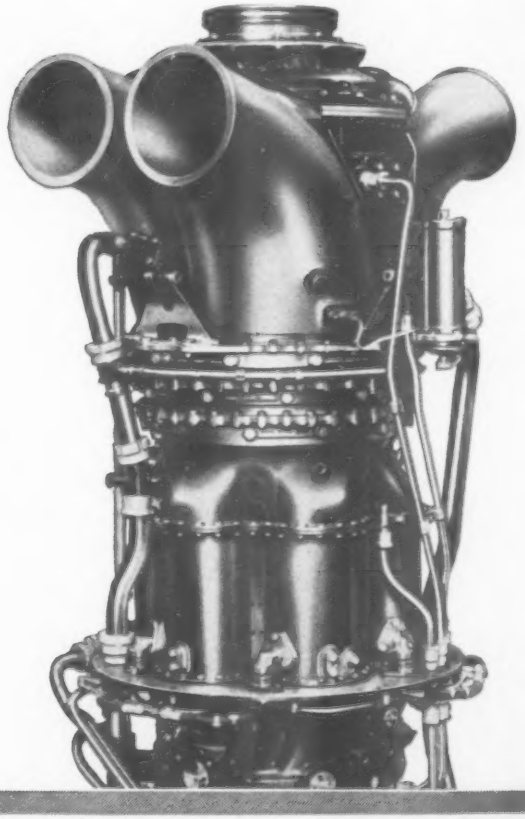

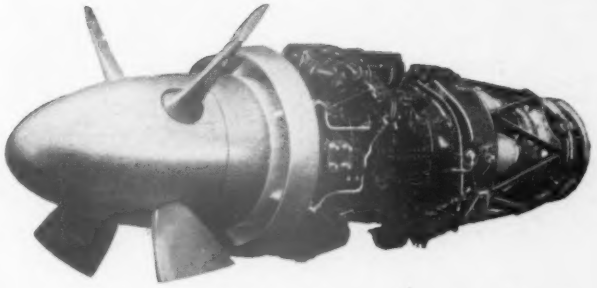

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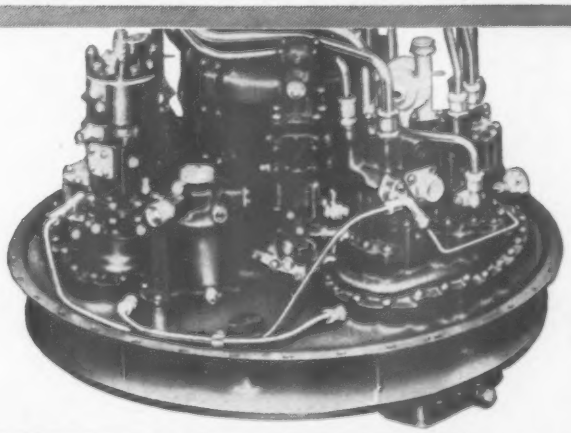

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ASIA—

Lebanon (contd.)

services and passenger/freight charter services. A twice-weekly service is operated from Teheran, Baghdad and Beirut to Frankfurt via Brindisi and Basle; other services link Beirut with Kuwait, Dhahran, Bahrein and Doha.

AIRCRAFT (mid-1961): 5 DC-4, 3 Avro York, 1 Prentice.

MANAGEMENT: Managing director, Munir Abu Haidar; general manager, Michael V. Richmond; chief engineer, Jack Woodhouse; chief pilot, Capt. David Prowse.

MONGOLIA

Mongolian Airlines (UVS MNR).—(Air Transport Administration of the Mongolian People's Republic).—The Airport, Ulan-Bator.

Operates between Ulan-Bator and Irkutsk in co-operation with Aeroflot, and to Peking.

AIRCRAFT: Il-14M, Il-14.

NEPAL

Royal Nepal Airline Corporation, Ltd.—Khatmandu.

Operates domestic services within Nepal and into India.

AIRCRAFT (March, 1961): 5 DC-3.

PAKISTAN

Pakistan International Airlines Corporation. — P.I.A. Administrative Building, Karachi Airport, Karachi.

Constituted by the Government and started operations in June, 1954, as Pakistan International Airlines, and became a national corporation in March, 1955, when it took over the services, equipment and personnel of Orient Airways. The Government has the controlling interest in the corporation. Overseas services were started in February, 1955. The Corporation is responsible for the operation of all air services within Pakistan and for regional services to Bombay, Delhi, Calcutta and Rangoon. A thrice-weekly Boeing 707 service between Karachi and London is operated via Teheran, Beirut, Rome, Geneva; one of these services has now been extended to New York.

AIRCRAFT (mid-1961): 1 Boeing 707, 2 L-1049H, 3 L-1049C, 3 Viscount 815, 3 F-27, 8 DC-3; on order, 3 Boeing 720B, 2 F-27.

MANAGEMENT: Chairman, Mirza Ahmad Ispahani; managing director, Air Cdre. M. Nur Khan; operations director, Enver Jamall. Managers: planning, M. M. Salim; commercial, J. S. Mirza; ground operations, Capt. S. U. Kureshi; flight operations, Capt. Anwar Masood; engineering, Aijaz Ali; administrative, Gp. Capt. Said-ud-din. Comptroller, A. Z. Rahman.

PERSIA

United Iranian Airways.—Teheran.

On Nov. 2 a merger between Iranian Airways (Iranair) and Persian Air Services was due to become effective. Iranair was formed in 1944 and operated domestically and to points in the Middle East, Afghanistan, Pakistan and Europe. Persian Air Services, which started freight operations in 1956, had been flying passenger services to Europe in co-operation with Sabena.

AIRCRAFT: (Iranair) 3 Viscount 782, 2 DC-4, 13 DC-3; (P.A.S.) 2 DC-7C, 1 DC-6A, 1 DC-4.

MANAGEMENT: Post-merger executives not yet known. Pre-merger: President and managing director (Iranair), Reza Afshar; asst. managing director (Iranair), Houshang Afshar. President (P.A.S.), Ahmed Chafik.

PERSIAN GULF

Gulf Aviation Co., Ltd.—Speedbird House, Manama, Bahrain Island.

Gulf operates services from Bahrein and undertakes local charter work. The company was formed in 1950 and was taken over by B.O.A.C. in 1951.

AIRCRAFT (mid-1961): 4 DC-3, 4 D.H. Heron, 2 D.H. Dove.

MANAGEMENT: Chairman, G. Beeby Thompson; exec. director, E. H. W. Lewis; general manager, Capt. A. J. Bodger; chief engineer, P. Williams; accountant, T. Kikla.

Kuwait Airways.—P.O. Box 394, Kuwait, and (commercial department) P.O. Box 4039, Beirut, Lebanon.

Kuwait Airways founded in 1953 and operates services to Bahrein, Abadan, Jerusalem, Damascus, Cairo, Beirut, Dhahran, Doha, Karachi and Bombay.

AIRCRAFT: (Sept., 1961): 4 Viscount 702/761.

MANAGEMENT: Chairman, Nisf Yusuf Al Nisf; vice-chairman, Abdul Aziz Al Saqr; chief executive, M. J. C. Auster; manager, A. R. Mishri; commercial manager, S. M. Killingbeck; chief pilot, Capt. A. W. Hebborn; chief accountant, Y. Hindi; chief engineer, J. D. Green.

Trans Arabia Airways—Al-Safat Square, Kuwait.

Licensed in Kuwait, this scheduled carrier has its base in Beirut, Lebanon, and operates between these points via Damascus, Jerusalem and Cairo.

AIRCRAFT (mid-1961): 2 DC-6, 2 DC-4.

PHILIPPINES

Philippine Air Lines, Inc.—Makati Building, Ayala Boulevard, Makati, Rizal, Manila.

Originating in 1932 as the Philippine Aerial Taxi Co., P.A.L. was reorganized under its present name in 1941. Long-haul services were started between the Philippines and the U.S.A. in 1946, but were suspended in 1954. The company at present operates over a large domestic network and to Hong Kong, pending a renewal of intercontinental operations.

AIRCRAFT (mid-1961): 3 Viscount 784, 3 F-27, 26 DC-3, 4 D.H.C. Otter, 2 Twin Pioneer; on order, 2 DC-8.

MANAGEMENT: Exec. vice-president, Rafael Igoa; adviser, Daniel M. Gomez. Vice-presidents: operations, Capt. Renato L. Baretto; traffic and sales, Capt. Roberto Lim; engineering and maintenance, James Searl; treasurer, Ralph Schnabel.

PORTUGUESE INDIA

Transportes Aéreos da India Portuguesa.—The Airport, Goa.

Operates regional and long-haul services between Goa and Karachi, Beirut, Malta, Lisbon, Beira and Lourenzo Marques.

AIRCRAFT (mid-1961): 3 DC-6B, 2 DC-4, 2 Viking.

MANAGEMENT: Director, Lt.-Col. A. G. Solano d'Almeida.

SAUDI ARABIA

Saudi Arabian Airlines.—P.O.B. 167, Jeddah.

Formed in 1946, this carrier is owned by the government and managed by T.W.A. Services are flown domestically and to Cairo, Beirut, Khartoum, Aden, Baghdad, Dhahran and intervening points.

AIRCRAFT (mid-1961): 1 DC-6B, 10 Convair 340, 4 DC-4, 10 DC-3, 5 Bristol 170.

MANAGEMENT: Technical manager, R. W. Wilson; supt. flight operations, S. M. Bigler.

SINGAPORE

Malayan Airways, Ltd.—Airways House, Raffles Place (P.O. Box 397), Singapore, 1.

Malayan was registered in 1937, but it was not until 1947 that the company acquired aircraft and started operations. At the end of 1957 the ownership changed hands and B.O.A.C. and Qantas became the principal shareholders, others being the Governments of the Federation of Malaya, the State of Singapore, and the Colonies of Sarawak and North Borneo and the State of Brunei. Operates services throughout Malaya, Singapore, North Borneo, Brunei and Sarawak and into Indonesia and Thailand. Services to Hong Kong were resumed in September with Britannia 102s.

AIRCRAFT: 8 DC-3, 2 Viscount 760, 1 Britannia 102.

MANAGEMENT: General manager, Capt. R. P. Mollard; dep. general manager, K. R. Hamilton; secretary/chief accountant, A. A. Cooper; operations manager, Capt. J. R. Brown; traffic manager, A. G. Beohm; chief engineer, E. R. Brown; staff manager, Seet Leong Seng; sales manager, S. J. Lloyd.

THAILAND

Thai Airways Co., Ltd.—6 Larn Luang Road, Bangkok.

Formed in 1951 by the merger of Pacific Overseas Airlines (Siam) and Siamese Airways Co., Thai Airways operates domestically and to Penang, Vientiane and Siem Reap.

AIRCRAFT (mid-1961): 7 DC-3, 2 DC-4.

MANAGEMENT: Chairman, Air Chief Marshal Boonchoo Chandrubeksa; managing director, Air Marshal Perm Limpisvasti; chief of administration division, Jat Watangkura; chief of transportation and building facilities div., Chinoros Nakasingh; acting chief of technical and inspection div., Jat Watanangkura; chief service of supply div., Somchai Vanasant; chief of operations dept., Ratana Svetanant; acting traffic and sales manager and chief of accounting dept., Choob Itthikul; chief of overhaul base dept., Plob Venunand.

Thai Airways International, Ltd.—1101 New Road, Bangkok, Thailand.

Following an agreement in 1959 between Thai Airways and Scandinavian Airlines System, Thai International has, since May, 1960, been designated the international flag carrier of Thailand. S.A.S. provides technical and administrative assistance and acts as World Agent. Services are operated to Hong Kong, Taipei, Tokyo, Rangoon, Calcutta, Kuala Lumpur, Singapore, Djakarta, Pnom Penh, Saigon.

AIRCRAFT (Aug., 1961): 3 DC-6B.

MANAGEMENT: Managing director, Cmdr. Prasong Suchiva; executive manager, H. E. Hansen; treasurer, R. Damstroem; traffic and sales manager, Chr. Hunderup.

VIETNAM

Air Vietnam. — 116 Boulevard Nguyen-Hue (P.O.B. 217), Saigon.

Formed in 1951, Air Vietnam operates internally and to Laos, Cambodia and Thailand. In pool with Air France, services are also flown to Paris and Hong Kong.

AIRCRAFT (mid-1961): 2 Viscount 708, 1 DC-4, 6 DC-3.

MANAGEMENT: President, Nguyen Van Khai; general manager, Nguyen Tan Trung.

YEMEN

Yemen Airlines. — Taiz, Yemen, Arabia.

Operates from Taiz to Djibouti, Hodeida and Jeddah.

AIRCRAFT: 2 DC-3, 3 Aero Commander.

AUSTRALASIA

AUSTRALIA

Airlines of New South Wales Pty., Ltd.—Kingsford Smith Airport, Mascot, N.S.W.

This company, which was founded in 1934 and registered as a public company in 1952, was known, until December, 1959, as Butler Air Transport. It is now a wholly owned subsidiary of Ansett Transport Industries and operates services throughout New South Wales, South Queensland and Victoria, and flying-boat services to Lord Howe Island from Sydney and through the Great Barrier Reef from Mackay and Proserpine.

AIRCRAFT (August, 1961): 4 F-27A, 5 DC-3, 2 Short S25E Sandringham, 1 28-5ACF Catalina.

MANAGEMENT: Chairman, R. M. Ansett; general manager, Capt. S. C. Middlemiss; secretary, K. N. M. Hillyar; operations manager, Capt. C. C. Henry; technical manager, K. H. Goddard; traffic manager, J. Buchanan.

Airlines of South Australia Pty., Ltd.—Adelaide Airport, West Beach, Adelaide, South Australia.

Formed in 1927 as Guinea Airways, this company was originally concerned with the movement of freight and personnel to and from the goldfields of New Guinea. In 1937 services were extended to Australia and operations were later based on Adelaide. The present name was adopted in 1959, when it became a member of the Ansett Transport Industries Group. It operates in S. Australia, N.S.W. and Victoria.

AIRCRAFT (mid-1961): 2 Convair 440, 4 DC-3.

MANAGEMENT: Chairman, R. M. Ansett; general manager, L. Connelly; secretary, C. A. Window.

Ansett/A.N.A.—Airways House, 489 Swanston Street, Melbourne, C.1, Victoria.

In 1957 Ansett Transport Industries, which controlled Ansett Airways, purchased Australian National Airways and the operations of the two companies were integrated. Ansett Airways started operations in 1936. A.N.A.'s history began in 1932, when operations were started by Holyman Brothers. The 15,000-mile domestic network takes in all the main centres and Port Moresby, Lae (New Guinea) and Darwin.

AIRCRAFT: 3 Electra, 5 Viscount 832, 2 Viscount 747, 4 F-27, 4 DC-6B, 3 DC-4 (all-freight), 3 Convair 440, 10 DC-3, 3 Bell 47J, 1 Bristol 171.

MANAGEMENT: Chairman, R. M. Ansett; general manager, Frank Pascoe; asst. to general manager, G. S. Drury; commercial manager, J. A. North; finance manager and secretary, A. Flanders; operations manager, Capt. P. J. Gibbes; controller, E. J. B. Forrester.

East-West Airlines, Ltd.—The Airport (P.O. Box 249), Tamworth, N.S.W.

East-West Airlines was formed in 1947. Services link country and coastal centres of New South Wales and Southern Queensland with both Brisbane and Sydney. E.-W.A. took over South Coast Airways in 1953.

AIRCRAFT: 4 DC-3, 1 F-27.

MANAGEMENT: Chairman, D. M. Shand; deputy chairman, J. B. Regan; acting manager, J. G. Riley; secretary and administration manager, R. O. Cooksey; chief engineer, J. S. Bolton; acting operations manager, Capt. R. W. Walesby; traffic supt., N. V. Buchanan.

Connellan Airways, Ltd.—Townsite Aerodrome, Alice Springs (P.O. Box 1), Northern Territory.

Connellan was founded in 1938 and was wholly owned by E. J. Connellan until 1951, when it was taken over by a limited company. Connellan serves more than 110 stations through the Territory, calling also at points in Western Australia, Queensland and South Australia.

AIRCRAFT: 1 Beech Baron, 3 Beech 18, 2 Beech Travelair, 3 Cessna 180, 2 Cessna 182.

MANAGEMENT: Governing director, E. J. Connellan.

Mac.Robertson Miller Airlines, Ltd.—194 St. George's Terrace, Perth, Western Australia.

Following a merger with Airlines (W.A.) in 1955, this company has operated throughout Western Australia and the Northern Territory. Mac. Robertson Miller was formed in 1927 in South Australia, taking over the Commercial Aviation Co., which was founded by H. C. Miller in 1922, and transferred operations to Western Australia in 1934. Airlines (W.A.) was founded in 1935.

AIRCRAFT: 1 F-27, 6 DC-3, 1 D.H. Dove.

MANAGEMENT: Managing director, Capt. C. N. Kleinig; regional director, H. C. Miller; secretary, E. C. Gare; operations manager, K. D. Cohen.

(*Continued on page* 612)

Airlines of the World . . . .

AUSTRALASIA

Australia (contd.)

Qantas Empire Airways, Ltd.—Qantas House, 70 Hunter Street, Sydney (P.O.B. 489), N.S.W.

The original Qantas (Queensland and Northern Territory Aerial Services) was formed in 1920 and the first regular service was flown in 1922. In 1931 Qantas joined Imperial Airways in carrying the first experimental mails between Australia and England. Q.E.A. was incorporated in 1934, and in 1947 became the Government's instrument for the operation of all Australia's international services when the shareholdings were purchased by the Government. Domestic services were transferred to T.A.A. in 1949 and B.C.P.A. was taken over in 1954. Qantas operates around-the-World turbojet service through the U.S. to London, Europe and the Middle East, and back to Sydney; and services to San Francisco, Vancouver, Tokyo, Hong Kong, Johannesburg, Noumea and Norfolk Island.

AIRCRAFT (mid-1961): 7 Boeing 707-138/138B, 4 Electra, 8 L-1049, 2 DC-4, 1 DC-3 (training); on order, 4 Boeing 707-138B.

MANAGEMENT: Chairman, Sir Hudson Fysh, K.B.E., D.F.C.; vice-chairman, R. R. Law-Smith, A.F.C.; chief executive and general manager, Cedric O. Turner, C.B.E.; dep. chief executive and dep. general manager, Capt. R. J. Ritchie; director of technical services, Capt. P. W. Howson, O.B.E.; director of commercial services, C. W. Nielson; director of finance, F. C. Derham.

Queensland Airlines Pty., Ltd.—Brisbane Airport, Brisbane, Queensland.

Founded in 1927 as Aircrafts Pty., Ltd., this is the oldest Australian inter-State airline. Its present name was adopted in 1947 and it is now associated with Ansett Transport Industries. A network of services is operated within Queensland and to New South Wales.

AIRCRAFT (mid-1961): 2 DC-3, 1 F-27.

MANAGEMENT: Chairman, R. M. Ansett; general manager, D. W. Cameron; secretary, T. O. Foulkes; commercial manager, D. C. McDonough; operations manager, Capt. Mitchell.

Trans-Australia Airlines.—339 Swanston Street, Melbourne, C.1., Australia.

Established in 1946 to operate domestic services, this is a Government-sponsored operator, controlled by the Australian National Airlines Commission. T.A.A. covers the largest domestic network in the Commonwealth, serving centres throughout Australia and in Papua and New Guinea.

AIRCRAFT (Sept., 1961): 3 Electra, 12 Viscount 756/816, 2 DC-6B, 9 F-27, 2 DC-4, 21 DC-3 (4 all-freight), 3 D.H.C. Otter, 2 Bristol 170, 1 Catalina, 1 Cessna, 2 Hiller, 1 Bell 47.

MANAGEMENT: Chairman, Sir Giles Chippindall, C.B.E.; general manager, John P. Ryland, C.B.E., D.F.C.; asst. general manager, Capt. J. Chapman, O.B.E.; director of engineering, J. L. Watkins, O.B.E.; director of operations, R. E. Bailey, D.S.O., D.F.C.; director of finance, R. E. Edelston-Pope, D.S.C.; commercial director, L. L. McKenzie.

Woods Airways Pty., Ltd.—National House, 49 William Street, Perth, W. Australia.

Incorporated in 1947, Woods Airways has, since 1948, operated over the Perth-Rottnest Island route.

AIRCRAFT (mid-1961): 2 Anson.

MANAGEMENT: Managing director, Capt. James Woods.

Fiji

Fiji Airways, Ltd. — Victoria Arcade, Suva.

Since 1951 Fiji Airways has operated over a local network, including a service connecting Suva with Nadi, the international airport, and to Tonga. Non-scheduled flights are made to other Pacific groups. The company was purchased by Qantas in 1958; since Jan. 1, 1960, B.O.A.C.(A.C.), TEAL and Qantas have been joint owners.

AIRCRAFT (mid-1961): 3 D.H. Heron, 2 D.H.A. Drover, 1 D.H.C. Beaver (amphibian).

MANAGEMENT: Manager, C. D. Ritchie; chief pilot, M. J. F. Morrissey; chief engineer, K. P. Beohm; secretary, R. S. Kay.

FRENCH OCEANIA

Reseau Aérienne Interinsulaire.—Messageries Maritimes (P.O. Box 96), Papéété, Tahiti, Society Islands.

R.A.I. flies local services in the Society Islands, and started operations in 1951. It is managed by the Service of Public Works and Mines.

AIRCRAFT: 2 Catalina, 1 Sandringham.

MANAGEMENT: Manager, R. Yvernat.

NEW CALEDONIA

Société Calédonienne de Transports Aériens (Transpac).—6 Rue de Verdun, Nouméa.

Transpac was founded in 1955. Services to the Loyalty Islands and Ile des Pines are now subsidized by the Territory. Shares in the company are privately owned.

AIRCRAFT (mid-1961): 1 D.H. Rapide, 2 D.H. Heron.

MANAGEMENT: President, H. G. Martinet; manager, H. C. Coursin; tech. manager, J. A. Lafargue; chief engineer, M. A. Couillaud.

NEW GUINEA

De Kroonduif, Ltd.—1 Plesmanweg, The Hague, Holland.

This company operates local services from Biak. It is managed by K.L.M.

AIRCRAFT: 3 DC-3 (K.L.M.), 3 D.H.C. Beaver, 3 Twin Pioneer.

Mandated Airlines, Ltd.—P.O. Box 25, Lae, North-east New Guinea.

Founded in 1936, Mandated operates local services from Lae. It is now a subsidiary in the Ansett Transport Industries Group (Australia).

AIRCRAFT (mid-1961): 11 DC-3, 2 Piaggio 166.

MANAGEMENT: Managing director, J. B. Sedgers; manager, V. Nagle; secretary, E. Hay.

NEW ZEALAND

Airlines of New Zealand, Ltd.—3rd Floor, Chelsea House, Fort Street (P.O.B. 1670), Auckland, C.1.

South Pacific Airlines of N.Z. (its full title) is a new company, associated with Ansett (Australia), which operates over a 14-point network including Auckland, Wellington, Christchurch and Invercargill. Other routes are being applied for and the emphasis is on the need to serve previously neglected areas.

AIRCRAFT: 2 DC-3; on order, 1 DC-3.

MANAGEMENT: Chairman, J. F. Johnston; secretary, G. R. Brabant; general manager, Capt. R. D. Daniell; operations manager, Capt. R. A. L. Anderson; accountant, C. Wiseley; maintenance engineer, W. Ingham; sales supervisor, A. C. Bremner.

Bay of Plenty Airways, Ltd.—Churchill Buildings (P.O. Box 448), Grey Street, Tauranga.

Formed in 1956 as Tauranga Air Services, the present name was adopted in August, 1958, and in November scheduled services were started. These are now operated between Auckland, Tauranga, Rotorua, Whakatane and Wellington.

AIRCRAFT (Aug., 1961): 1 Aero Commander 680, 1 Cessna 182.

MANAGEMENT: Secretary/manager, A. P. Carey; chief pilot, A. J. McLeod; traffic manager, S. B. Head.

New Zealand National Airways Corporation.—P.O. Box 96, Wellington.

Founded in 1945 with Government capital, N.Z.N.A.C. operates the majority of the Dominion's air services.

AIRCRAFT: 4 Viscount 807, 8 F-27, 20 DC-3 (passenger), 6 DC-3 (freight).

One of S.P.A.N.Z.'s two DC-3 Viewmasters at Hokitika, South Island, New Zealand.

MANAGEMENT: Chairman, A.V.M. Sir Leonard Isitt, K.B.E.; general manager, D. A. Patterson, M.B.E.; dep. general manager, L. L. Ford; assist. general manager, G. K. Grocott; supt. of research and development, Capt. H. C. Walker, M.V.O., A.F.C.; operations manager, Capt. P. A. Matheson, O.B.E.; commercial manager, W. J. Jennings; engineering supt., C. W. Labette; supply manager, D. W. Johnston; secretary to the board, A. A. Hoffman; chief accountant, A. R. A. Otton; public relations officer, A. G. Feslier; personnel manager, G. M. Hyde.

Northland Airways (Rent-a-Plane Services (N.Z.), Ltd.).—Northland Airways Section, P.O.B. 5226, Auckland.

This company started operations on Nov. 1, 1959, and now flies a scheduled service throughout the North Auckland area and acting as feeder to N.Z. National Airways.

AIRCRAFT (mid-1961): 1 Cessna 180.

MANAGEMENT: Managing director, V. R. Draffin.

Southern Scenic Air Services.—No. 1 R.D., Cromwell.

Operates between Queenstown and Dunedin.

AIRCRAFT: D.H. Rapide.

Tasman Empire Airways, Ltd.—P.O. Box 2201, Auckland.

TEAL was formed in 1940 under the joint ownership of New Zealand, Australia and the U.K. to operate services between Australia and New Zealand. Since April 1, 1961, it has become a fully owned and operated New Zealand airline following the purchase of all shares by the New Zealand Government. It operates services to Australia and Fiji, to Norfolk Island and from Fiji to Samoa and Tahiti.

AIRCRAFT (mid-1961): 3 Electra.

MANAGEMENT: Chairman, A. V. M. Sir Leonard Isitt, K.B.E.; general manager, F. A. Reeves; asst. general manager, J. R. McGrane; chief engineer, L. Brister, commercial manager, H. M. Denton.

Tourist Air Travel.—Mechanic's Bay, Marine Airport, Auckland.

Although T.A.T. has not been a scheduled operator, it has recently merged with Amphibian Airways, of Invercargill, which has been operating with Grumman Widgeons over the Invercargill-Stewart Island route. Expansion of services is planned.

AIRCRAFT: 4 Grumman Widgeon.

MANAGEMENT: Chief pilot and manager, Capt. F. Ladd; secretary, A. Duthie; operations manager, H. Bennett.

West Coast Airways, Ltd.—Seaview Airport (P.O. Box 106), Hokitika, Westland.

West Coast took over its scheduled services between Hokitika, Haast and Milford Sound from N.Z.N.A.C. in 1956.

AIRCRAFT: 2 D.H. Rapide, 1 Cessna 180.

MANAGEMENT: Managing director, F. J. Lucas; directors, B. Topliss and J. R. Kilian.

SAMOA

Polynesian Airlines.—Burns Philip Buildings, Apia, W. Samoa.

Operates between Apia and Pago Pago.

AIRCRAFT: Percival Prince.

Samoan Airlines.—1601 N. Gower St., Hollywood 28, California, U.S.A.

Operates between Apia and Pago Pago.

AIRCRAFT: DC-3.

EUROPE

AUSTRIA

Osterreichische Luftverkehrs Aktiengesellschaft (Austrian Airlines).—Opernring 13, Vienna 1.

Founded in 1957, Austrian Airlines started operations in 1958. The shareholders were S.A.S., Fred Olsens Flyselskap (from which Viscounts were chartered), banks and publicly owned undertakings in Austria. There has been a reorganization and an increase in capital this year and AUA now operates its own fleet. It serves points in Europe, including London, Brussels, Amsterdam, Frankfurt, Paris, Zurich, Rome, Warsaw, Moscow, Belgrade, Sofia and Bucharest.

AIRCRAFT (Aug., 1961): 5 Viscount 837, 2 Viscount 745.

MANAGEMENT: President, Dr. Josef Koller; managing director, Felix A. Schalk.

AZORES

Societade Acoriana de Transportes Aéreos, Ltda.—11-1 Rua Nova do Almada, Lisbon, Portugal.

Formed in 1947, this company is largely owned by Bensaude and Co. Local services are flown to Santa Maria and Terceira.

AIRCRAFT: 2 D.H. Dove.

MANAGEMENT: General manager, A. M. S. Noqueira.

BELGIUM

SABENA (Société Anonyme Belge d'Exploitation de la Navigation Aérienne).—Air Terminus, Brussels.

Sabena started operations in 1924. It is a commercial undertaking managed by a board of 15 directors, nine of whom are elected by the Belgian State, four by the Congo State and two by private interests. In Europe, Sabena serves 20 countries, intercontinental services are flown to New York, Montreal, Mexico, Tel-Aviv, Beirut, Cairo, Ankara, Tehran, Casablanca, Tripoli Benghazi, Johannesburg and the Congo Republic. The company's operations in Africa form a large network. For eight years Sabena has also been operating an international city-centre helicopter network.

AIRCRAFT (mid-1961): 4 Boeing 707-329, 8 DC-7C, 7 DC-6B, 4 Caravelle VI, 7 DC-4, 9 Convair 440, 28 DC-3, 5 Sikorsky S-58, 1 Bell 47H, 1 Alouette II; on order, 2 Caravelle VI, 2 Boeing 707-329.

MANAGEMENT: Chairman, Gilbert Périer; managing director, Gaston Claeys; general manager, Willem Deswarte; asst. general manager, Gaston Dieu; sen. vice-president, technical, Felicien Pirson; sen. vice-president, Anselme Vernieuwe; vice-president, sales, Valentin Pacco; vice-president, operations, Pierre Dils; secretary-general, Roger Nys; technical adviser, Fernand De Ridder; vice-president, Africa, Jean Annez de Taboada.

Sobelair (Société Belge de Transports Par Air, S.A.).—137 Rue Royale, Brussels.

Formed in 1946, Sobelair has, since 1947, been operating charter services

(*Continued on page* 613)

BIENVENUE À BORD

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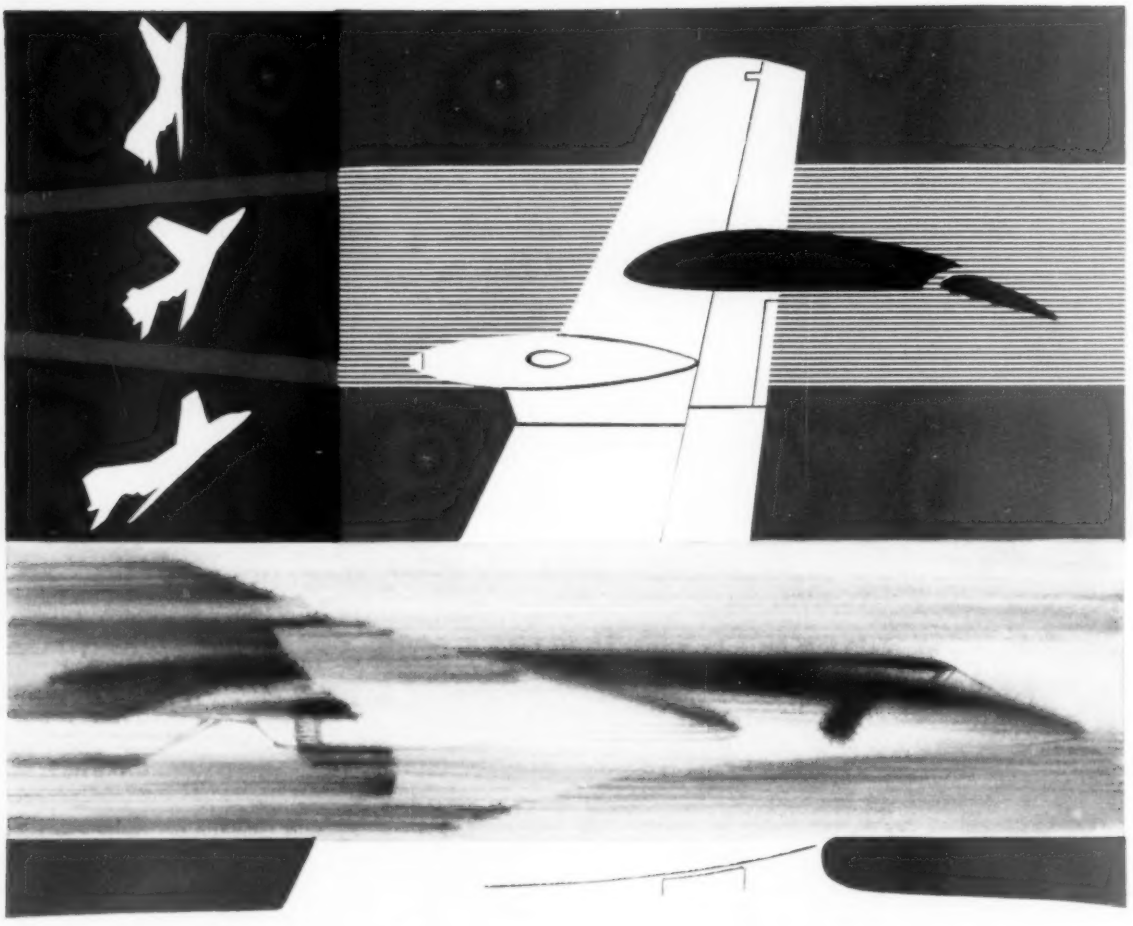

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EUROPE—

Belgium (contd.)

between Belgium and Ruanda-Urundi and the east of the Congo Republic. Regular schedules within the Congo were started in 1957 from Elizabethville, Stanleyville and Usumbura.

AIRCRAFT (mid-1961): 3 Cessna 310, 1 Beech E18S (DC-6Bs chartered from Sabena).

MANAGEMENT: Chairman and managing director, G. Claeys; general manager, P. Bertin; operations and technical adviser, J. Carlier.

BULGARIA

TABSO (Bulgarian Civil Air Transport).—12 Place Narodno Sobranie, Sofia C.

Successor to Bulgarske Vazdusne, Sobstenie, TABSO was formed in 1949 with Bulgaria and the U.S.S.R. sharing control. Russian interest was withdrawn in 1954. Operates domestically and to Belgrade, Vienna, Warsaw, Berlin, Bucharest, Kiev, Moscow and Budapest.

AIRCRAFT: 5 Il-14, 9 Li-2.

CYPRUS

Cyprus Airways, Ltd.—16 Byron Avenue, Nicosia.

The company was formed in 1947. The Government of Cyprus is the major shareholder (54%) with Cyprus citizens and B.E.A. holding 24% and 22% of the shares respectively. Under an agreement made with B.E.A. in 1958, and renewed in early 1961, B.E.A. Comet 4Bs operate on a charter basis over all sectors of the company's network.

MANAGEMENT: Chairman, G. Eliades; managing director, and general manager, P. Paschalides; asst. general manager, J. Theodossiou.

CZECHOSLOVAKIA

Ceskoslovenské Aerolinie.—Namesti Republiky 655/8, Prague, 1.

Services were restarted by Czechoslovak State Airlines in 1945; the company was nationalized in 1949. C.S.A. flies domestically and to Cairo, Bombay, Rangoon and Djakarta; Rabat; Dakar and Conakry; Belgrade, Berlin, Copenhagen, Stockholm, Helsinki, Moscow, Vienna, Budapest, Bucharest, Sofia, Tirana, Paris, London, Warsaw, Athens; and to Damascus and Baghdad.

AIRCRAFT (mid-1961): 4 Tu-104A, 6 Il-18, 6 Il-12, 25 Il-14, 5 DC-3.

MANAGEMENT: Director-general, Karel Stekl; director of operations, Václav Libovicky; technical director, Josef Procházka; commercial director, Ing. J. Jechumtál.

FINLAND

Finnair (Aero O/Y).—4 Töölönkatu (P.O.B. 278), Helsinki.

Aero O/Y was founded in 1923 and started its first services in 1924 using floatplanes. After airports were built at Helsinki and Turku the company was able to operate regularly all the year round. In 1947 DC-3s were purchased and the company extended its services, via Stockholm and Copenhagen, to Amsterdam, Hamburg and Dusseldorf. By 1953, Convair 340s had been acquired and operations to Paris and London were started. In 1956 Finnair started services to Moscow as the first West European airline to do so. In 1961 Finnair has been operating on the following routes from Helsinki: -Hamburg-Amsterdam - London/Paris; -Copenhagen-Cologne; -Copenhagen-Frankfurt; -Copenhagen-Zürich; -Moscow; -Stockholm-Oslo; -Vaasa-Sundsvall (Sweden); and Vaasa-Umea (Sweden).

AIRCRAFT: 7 DC-3, 7 Convair 440, 3 Caravelle IA/III.

MANAGEMENT: President, Gunnar Korhonen, Vice-presidents; technical, B. Aulin; traffic and sales, M. Mannio; operations, K. Temmes.

Karhumaki Airways (Kar-Air O/Y).—Lönnrotinkatu 3, Helsinki.

This company is an independent carrier, operating domestic routes in Finland and an international route to Stockholm. Scheduled domestic services were started in 1950.

AIRCRAFT: 3 DC-3, 2 Convair 440.

MANAGEMENT: Chairman, Niilo Karhumaki; president, Uuno Karhumaki; traffic manager, Lars Colliander; technical director, Tuomas Karhumaki.

FRANCE

Air France.—2 Rue Marbeuf, Paris, 8e.

France's national airline evolved in the early 1920s. By 1933 liquidation and mergers had reduced the early companies to one—Air France, with Air Bleu, formed in 1935, to look after postal services and in 1937, Air France Transatlantique to fly to America. In 1948, the three companies were absorbed into the Compagnie Nationale Air France, a limited liability company. In 1953 it was empowered to acquire interests in other overseas French air transport concerns. Air France holds shares in Royal Air Maroc, Air Transport, Tunis Air, Air Inter, Air Liban, Air Vietnam, Air Laos, Royal Air Cambodge, Relais Aériens and SITA. It operates over the longest network in the World, 200,000 miles; overseas services are flown to North, Central, West and East Africa and Mauritius; to the Middle East, India, Vietnam, Hong Kong, Manila, Japan (Polar flights); and to North, Central and South America. Apart from its intra-European services it also operates over a metropolitan network and flies a night airmail service.

AIRCRAFT (mid-1961): 17 Boeing 707-328, 27 Caravelle, 9 L-1649A, 19 L-1049, 4 L-749, 12 Breguet Deux Ponts, 27 DC-4, 32 DC-3; on order, 12 Caravelle, 4 720B.

MANAGEMENT: President, Joseph Roos; general manager, Louis Lesieux; dep. general managers, Maurice Lemoine (secretary general); Robert Montarnal (economics and finance); Raymond Dupré (technical); traffic and sales manager, Michel de Villeneuve; operations manager, Pierre Marion; material manager, Jacques Scherer; personnel manager, Jean Roubaud.

Air Inter (Lignes Aériennes Intérieures).—12 rue de Castiglione, Paris, 1.

Two of C.S.A.'s Tu-104As on the apron at Prague Airport.

Founded in 1954 for the purpose of studying domestic air transport operations, Air Inter started regular services in June, 1960; with aircraft chartered from Air France, T.A.I. and Airnautic. The majority of the shares are held by Air France (24.95%), French Railways (24.95%), Union Aéromaritime de Transports (7.27%), Transports Aériens Intercontinentaux (7.27%) and Air Algérie (7%); the remainder are held by banks and road transport operators.

AIRCRAFT (leased): 2 L-749, 1 DC-6, 3 Viking, 2 DC-3; likely order for 5 Breguet 942.

MANAGEMENT: General manager, P. Hebrard; secretary, P. Marland; technical manager, J. Arnaud; commercial manager, J. Francois.

Cie Air Transport.—9 Boulevard Malesherbes, Paris, 8.

This company started charter flying in July, 1946, and later operated a freight service between London and Paris. The company now operates vehicle/passenger services in co-operation with Silver City Airways on the Lydd-Le Touquet, Lydd-Calais and Hurn (Bournemouth)-Cherbourg routes.

AIRCRAFT: 3 Bristol 170 Mk. 32.

Cie. de Transports Aériens Intercontinentaux (T.A.I.).—Orly Airport (B.P. 118), Paris.

A private company, T.A.I. was founded in 1946. Services are flown to Morocco, West Africa, Somaliland, Madagascar, Greece, Egypt, Pakistan, Indo-China, Indonesia, Australia, New Zealand, New Hebrides, Fiji, Tahiti, Honolulu and Los Angeles. Provisional arrangements have recently been made for a merger with Union Aéromaritime de Transport.

AIRCRAFT: 3 DC-8, 2 DC-7, 5 DC-6, 2 DC-4, 5 DC-3.

MANAGEMENT: President, Gen. G. Fayet; director-general, J. J. Wilmot-Roussel; technical director, P. Wiker; commercial director, A. Gaffie; sales manager, F. Serraz.

Union Aéromaritime de Transport.—3 Boulevard Malesherbes, Paris 8e.

This company, with an air history going back to 1937, was founded in 1949 and is associated with Cie. Maritime des Chargeurs Réunis. Following co-ordination with Air France and T.A.I. services, it now operates from Paris to South Africa, Rhodesia, West Africa and Central Africa. U.A.T. also operates local connecting services in West and Central Africa. A new company, Air Afrique, has been formed to take over the joint operation of U.A.T. and Air France within Africa. Provisional arrangements have been made for a merger with T.A.I.

AIRCRAFT (Aug. 1961): 2 DC-8, 10 DC-6, 7 D.H. Heron, 4 DC-4.

MANAGEMENT: Chairman and managing director: Louis Pommery; directors, Jean Combard and Roger Loubry; asst. directors, A. Veillard and J. P. Villaceque.

GERMANY (EAST)

Deutsche Lufthansa.—Französische Str. 53-56, Berlin, W.8, German Democratic Republic.

The East German Deutsche Lufthansa was founded in May, 1954. International services are operated to Belgrade, Budapest, Bucharest, Moscow, Prague, Sofia and Tirana. A domestic route network is also served.

AIRCRAFT: 3 IL-18, 12 IL-14, 30 IL-12.

MANAGEMENT: General director, Arthur Pieck; dep. general director, Karl Heiland; director of flight operations, Walter Lehwess-Litzmann; technical director, Ernst Wendt.

Gesellschaft für Internationalen Flugverkehr m.b.H. (Interflug).—Address as for Deutsche Lufthansa above.

Interflug was founded in September, 1958. International services are operated to Budapest, Belgrade and Tirana. It also operates international charter flights.

Aircraft and management as for Deutsche Lufthansa.

GERMANY (WEST)

Deutsche Lufthansa Aktiengesellschaft.—1 Claudiusstrasse, Cologne.

Lufthansa, whose history goes back to Deutsche Luftreederei in 1919 and to 1926 when the original D.L.H. was formed, started its post-war operations with domestic services and to European centres in 1955. Transatlantic services were started in June, 1955, and services to South America and the Middle East in 1956. It now also operates to Pakistan, India, Siam and the Far East.

AIRCRAFT (July, 1961): 5 Boeing 707-430, 9 Convair 440, 7 L-1049G, 4 L-1649A, 11 Viscount 814, 4 Boeing 720B; on order, 12 Boeing 727.

MANAGEMENT: Chairman, Dr. Hermann J. Abs; directors, Hans M. Bonzers (managing), Dipl.-Ing. Gerhard Höltie, Wolfgang A. Kittel, Dipl.-Ing. Hans Süssenguth.

Air France line-up at Orly Airport, Paris—Boeing 707-328s and Caravelles.

Airlines of the World . . . .

EUROPE (contd.)

GIBRALTAR

Gibraltar Airways, Ltd.—Cloister Building, Gibraltar.

Formed in 1947. M. H. Bland and Co., Ltd., a Gibraltar shipping company, holds 51% interest, the other 49% being held by B.E.A. Services to Tangier are operated by B.E.A. aircraft.

MANAGEMENT: Directors, Sir George Gaggero, O.B.E., J.P. (chairman), the Earl Amherst, M.C. (deputy chairman), J. J. Gaggero, A. C. Ping, W. A. Caro and J. G. Gaggero (alternate).

GREECE

Olympic Airways, S.A.—6 Othonos Street, Athens.

Olympic started operations on April 6, 1957 taking over and developing all national domestic and international air services. It succeeded Greek Airlines T.A.E., founded by amalgamation in 1951 and taken over by the Government in 1955. Apart from a domestic network, Olympic operates international services to all major points in Europe and the Middle East. Olympic has a partnership agreement with B.E.A.

AIRCRAFT: 3 Comet 4B, 3 DC-6B, 2 DC-4, 13 DC-3.

MANAGEMENT: General manager, S. Damaskinos; technical director, C. Danis. Managers: commercial, Ch. Mavrokefalos; system sales, J. S. Papadakis; administration, C. Kordoyannis; traffic, C. Xafolides; financial, M. Brachalis.

HUNGARY

Malév (Magyar Légiközlekedési Vállalat).—Vörösmarty Tér 5, Budapest V.

Malév was founded and started operations in 1946 as Magyar Szovjet Polgári Légiközlekedési R.T. (Hungarian Soviet Civil Air Traffic Co.) with Hungarian and Soviet capital. In 1954 Maszovjet was converted into a purely Hungarian State-owned company and the present title was adopted. Services are flown to most major European points and to London.

AIRCRAFT: 3 Il-18, 9 Il-14, Li-2.

MANAGEMENT: general manager, Alexander Hüvös; asst. general mgr., chief engineer, George Lénárt; commercial mgr., Vladimir Zamek; mgr., travel and freight dept., Béla Németh; chief accountant, Kálmán Kertai.

ICELAND

Icelandic Airlines (Loftleidir H.F.).—Lækjargata 2, P.O.B. 476, Reykjavik.

This company flew domestic services from 1944 until 1952. International services were started in 1947 to Copenhagen. Since 1948, scheduled services have been flown between Europe and America, via Iceland, calling at Amsterdam, Luxembourg, Hamburg, Copenhagen, Gothenburg, Oslo, Stavanger, Bergen, Helsinki, London, Glasgow, Reykjavik and New York.

AIRCRAFT: 4 DC-6B.

MANAGEMENT: Chairman, K. Gudlaugsson; general manager, A. Eliasson; manager, traffic and sales, M. Petersen; technical manager, H. Sigurjónsson; operations manager, E. K. Olsen; director, public relations, S. Magnússon.

Icelandair (Flugfelag Islands H.F.).—Reykjavik Airport, P.O.B. 1426, Reykjavik.

Founded in 1937, Icelandair operates services to centres in Iceland and from Reykjavik to Glasgow, London, Hamburg, Oslo and Copenhagen.

AIRCRAFT: 1 DC-6B, 2 Viscount 759, 3 DC-3, 1 DC-4.

MANAGEMENT: Chairman, G. Vilhjalmsson; general manager, Orn O. Johnson; chief pilot, J. R. Snorrason; chief engineer, B. Tomasson; secretary, S. K. Matthiasson.

IRELAND

Aer Lingus, Tta.—43 Upper O'Connell Street, Dublin.

Aer Lingus has been operating since 1936. Its issued share capital is now held by Aer Rianta, the Government-owned holding company (95.4%), and B.E.A. (4.6%). Services are operated from Dublin to London and Belfast to provincial and holiday centres in the U.K., to Amsterdam, Brussels, Cherbourg, Copenhagen, Dusseldorf, Frankfurt, Paris, Rome and Zurich. Seasonal services link Dublin with Lourdes, Rennes, Lisbon and Barcelona. Many of the company's services to the Continent operate through Manchester. Cork was included in the network last month.

AIRCRAFT: 7 Viscount 808, 7 F-27, 5 DC-3.

MANAGEMENT: General manager, J. F. Dempsey; dep. general manager, Capt. J. C. Kelly-Rogers; asst. general mgr., James Gorman; secretary, P. J. Brennan; asst. general mgr., (commercial), M. J. Dargan; asst. general mgr. (technical), Capt. W. J. Scott; financial controller, James Moran; commercial planning manager, J. T. O'Brien; chief engineer, Capt. P. McCormack.

Aerlinte Eireann, Tta.—43 Upper O'Connell Street, Dublin.

A sister company to Aer Lingus, Aerlinte Eireann was incorporated in 1947 to operate between Ireland and the U.S.A. The original plans did not mature, but the project was reactivated in 1958, when, using aircraft and crews leased from Seaboard, a transatlantic service was started to New York and, later, to Boston. Last year Aerlinte started to operate with its own fleet of 707s on the North Atlantic route.

AIRCRAFT: 3 Boeing 707-048.

MANAGEMENT: As for Aer Lingus, above.

ITALY

Alitalia—Linee Aeree Italiane.—Viale Maresciallo Pilsudski 92, Rome.

Alitalia was formed in 1946 with B.E.A. holding 30% of the shares. In 1957 it was merged with Linee Aeree Italiane. B.E.A. no longer has a shareholding. Alitalia operates domestic services and long-haul services to North and South America; to North, Central, East, West and South Africa; to the Middle East, Pakistan, India, Thailand, Cambodia and Australia; and to Austria, Belgium, Czechoslovakia, France, Germany, Greece, Holland, Portugal, Spain, Switzerland and the U.K.

AIRCRAFT (Oct., 1961): 6 DC-8, 9 Caravelle, 3 DC-7C, 2 DC-7F (cargo), 3 DC-6, 5 DC-6B, 14 Viscount 745/785, 4 DC-3; on order, 4 DC-8, 5 Caravelle III/VI.

MANAGEMENT: Chairman, Count Dr. Nicolo Carandini; vice-chairman, Gen. S. A. Aldo Urbani; general manager, Dr. Ing. Bruno Velani; vice-general manager, Dr. Donato Saracino; commercial manager, Renato Cappelletti; manager of special affairs, Ing. Piero Venturini.

Aviolinee Siciliane S.p.A.—Via Cimarosa 10, Catania, Sicily.

This new company is due to start operations shortly over a domestic network within Sicily from Fontanarossa Airport, Catania.

AIRCRAFT: 3 D.H. Heron.

MANAGEMENT: President, Dott. Gualtiero Nicotra.

Elivie (Societa Italiana Esercizio Elicotteri).—Viale Maresciallo Pilsudski 92, Rome.

Elivie operates services from Turin to and between Milan's two airports, and between Naples, Capri and Ischia.

AIRCRAFT: 4 Bell 47J, 2 Agusta 102.

MANAGEMENT: Chairman, Prof. Dr. Egidio Dagna; general manager, Count Ing. Antonio Farini.

Itavia (Societa di Navigazione Aerea S.p.A.).—Aeroporto dell' Urbe Airport, Via Salaria, Rome.

This carrier operated last year between Rome and Genoa and locally, but all services were suspended after the loss of a Heron. Services are due to restart later this year.

AIRCRAFT: 2 DC-3; on order, 2 H.P. Herald 200.

MANAGEMENT: General manager, Dr. Guido Mancini.

JUGOSLAVIA

Jugoslovenski Aerotransport.—Bircaninova 1/iii (P.O.B. 749), Belgrade, 3.

JAT was formed in 1947, as a Government-owned company, to take over all Jugoslavia's air transport, domestic and international.

AIRCRAFT: 13 DC-3, 2 Convair 440, 1 Convair 340, 6 Il-14, 2 DC-6B.

MANAGEMENT: Director-general, V. Terzic; traffic and operations director, V. Rakic; commercial director, G. Vojvodic; technical director, R. Radoikovic; financial director, R. Radojevic.

LUXEMBOURG

Luxembourg Airlines.—Luxembourg Airport, Luxembourg.

Successor to the earlier company of this name—which was helped with technical assistance and equipment by Scottish Aviation (from 1947) and, later, by Seaboard and Western Airlines—this is the new flag carrier of Luxembourg. It is due to start operations, with technical help from Fokker, in April, 1962, over routes to Paris, Amsterdam and Frankfurt.

AIRCRAFT: On order, 1 F-27.

MALTA

Malta Airways Co., Ltd.—285 Kingsway, Valetta.

This is an associate company of B.E.A., which operates services on its behalf on jointly licensed routes. Capital is held by Maltese shareholders and by B.E.A. (34%).

MANAGEMENT: General manager, J. T. Crossey.

NETHERLANDS

Koninklijke Luchtvaart Maatschappij N.V. (K.L.M. Royal Dutch Airlines), Plesmanweg 1, The Hague.

K.L.M. was founded in 1919 by banking and commercial interests. Of the airlines now operating K.L.M. was the first to fly a scheduled service, between Amsterdam and London, in May, 1920. In 1929 a regular service from Amsterdam to the Far East was opened, followed in 1935 by services in the Caribbean. In 1946 K.L.M. started services to North and Central America, in 1947 to South Africa and South America, and in 1951 to Australia. Of the issued and fully paid-up capital at June, 1961, about 68% is held by the Netherlands Government.

AIRCRAFT (mid-1961): 10 Convair 340, 9 DC-3, 6 DC-6, 4 DC-6A/B, 15 DC-7C/F, 11 DC-8, 10 L-749A, 19 L-1049E/G/H, 11 Electra, 9 Viscount 803; on order, 1 DC-8.

MANAGEMENT: President, E. H. van der Beugel; deputy president, F. Besançon; exec. vice-presidents, L. de Block, J. C. van der Kloot, L. H. Slotemaker and J. van der Wiel.

NORWAY

Braathens South-American and Far East Airtransport A.S.—Fr. Nansens plass 7, Oslo.

Formed in 1946, Braathens S.A.F.E. made its first Far East flight with a DC-4 early in 1947. In 1949 rights were obtained to fly scheduled services to Hong Kong, but these were withdrawn in March, 1954, and, internationally, only non-scheduled flights are now being made. S.A.F.E. operates a number of domestic services.

AIRCRAFT: 2 DC-4, 2 DC-3, 3 F-27.

MANAGEMENT: Chairman and president, Ludvig G. Braathen; vice-pres., Björn G. Braathen; operations manager, J. Rad; commercial manager, E. Fröysaa.

Widerøe's Flyveselskap A/S.—Wergelandsveien 7, Oslo.

This company was formed in 1934. Scheduled seaplane services are flown in north Norway (Bodö-Kirkenes) in co-operation with S.A.S. as well as charter and ambulance work, aerial survey and photography.

AIRCRAFT (mid-1961): 1 Douglas B-26, 2 Lockheed 12, 4 D.H.C. Otter, 6 Norseman, 1 Seabee, 1 Cessna 180.

MANAGEMENT: General manager, Viggo Widerøe.

POLAND

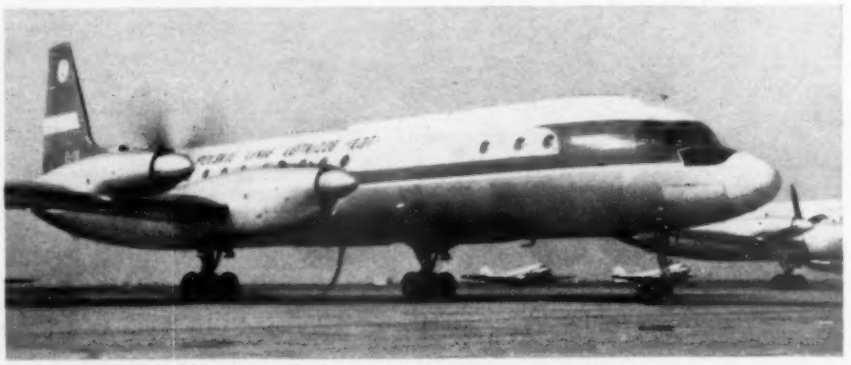
Polskie Linie Lotnicze, LOT.—Grojecka 17, Warsaw.

Government-owned, LOT'S history goes back to 1929. Domestic services and international services are operated to Berlin, Brussels, Moscow, London, Paris, Vienna, Copenhagen, Athens, Amsterdam, Zurich, Budapest, Belgrade, Rome and Sofia.

AIRCRAFT (mid-1961): 4 Convair 240, 12 Il-14, 8 Li-2, 3 Il-18.

MANGEMENT: Director-general, Jan Krzywicki; director, commercial and economics, Kazimierz Nowicki; genl. sales and traffic mgr., Augustyn Wojnowski.

(*Continued on page* 615)



Poland's LOT now has three Il-18s, one of which, with a second just in view on the right, is seen here at Warsaw's Okecié Airport.

Blackburn
(LICENSEES FOR TURBOMECA ENGINES)

is the
only British company
which has
specifically developed
a range of
small gas-turbines
to meet
the requirements
of modern aviation

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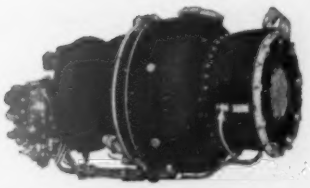
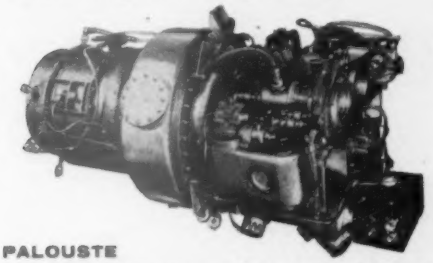
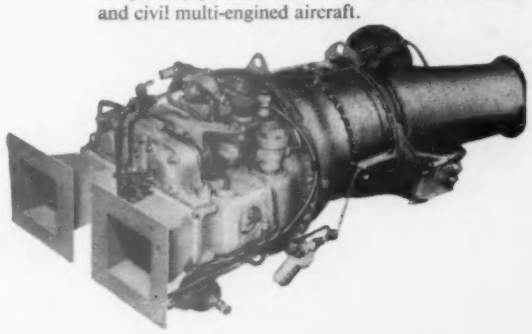


CUMULUS
The latest development in airborne units giving reduced size and weight and designed to meet all the most stringent air starting demands.

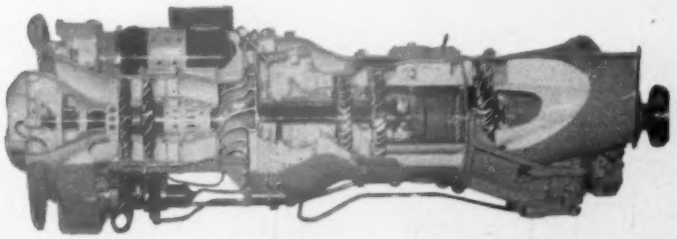


PALOUSTE
The standard low-pressure-air starter for the Royal Navy, Royal Air Force and aircraft manufacturers, etc.

ARTOUSTE
In quantity production as an A.A.P.P. for military and civil multi-engined aircraft.



TURMO
In production for helicopters, hovercraft and Royal Navy marine craft.



NIMBUS
A free-turbine engine in the 1,000-1,100 h.p. class specifically developed for helicopters and hovercraft.

E. 179

BEA

Europe's Foremost Airline

BRITISH EUROPEAN AIRWAYS

Airlines of the World . . . .

EUROPE (contd.)

PORTUGAL

Transportes Aéreos Portugueses, S.A.R.L.—79 Rua Conde Redondo (Apartado 2562) Lisbon.

This State-owned airline was formed in 1946 and reorganized in 1953. It operates services to Lourenzo Marques and Beira (Mozambique), Luanda (Angola), Kano, Tangier, Casablanca, Sal Island (Cape Verde), Recife, Rio de Janeiro, Funchal (Madeira), Beirut, Damascus, Karachi, Goa (Portuguese India), Madrid, Paris, London and domestically to Oporto.

AIRCRAFT (mid-1961): 5 L-1049.

MANAGEMENT: Chairman, Eng. Alfredo Vaz Pinto; general director, Eng. E. Mendes Barbosa; commercial director, Birger Grönlund; finance director, Dr. Ferreira Filipe; operations supt., Com. Marciano Veiga; maintenance supt., Eng. José Quinteiro.

RUMANIA

Tarom (Transporturile Aeriene Romine).—Bánceasa Airport, Bucharest.

Tarom, the State airline which succeeded the Soviet-Rumanian TARS in 1954, operates services to Budapest, Prague, Berlin, Copenhagen, Brussels, Belgrade, Moscow, Kiev, Sofia, Athens and Vienna, and domestically.

AIRCRAFT: 4 Il-18, Il-14, Il-12, Li-2.

MANAGEMENT: General mgr., V. Cosma; commercial manager, C. Nenoiu; technical manager, N. Vidvischi.

SCANDINAVIA

Scandinavian Airlines System.—Bromma Airport, Bromma 10, Stockholm.

S.A.S. was formed in 1946 by D.D.L. (Denmark), D.N.L. (Norway) and A.B.A. (Sweden) to operate transatlantic services. In 1948 its scope was extended to all international operations and in 1951 the three national airlines became partners in a reorganized S.A.S. which was financed 50% by State and 50% by private capital. Apart from an extensive European network, S.A.S. operates to Montreal and New York; to Los Angeles via Greenland; to Brazil, Uruguay, Argentina and Chile; to the Middle East, India, the Far East and Japan; to Tokyo via Alaska; and to South Africa. S.A.S. has an engineering and equipment agreement with Swissair and is a partner in Thai Airways International.

AIRCRAFT (mid-1961): 7 DC-8, 9 DC-7C, 13 Caravelle, 20 Convair 440; on order, 2 Convair 990.

MANAGEMENT: President, C. Nicolin. Exec. vice-presidents: foreign relations and personnel, Thore Boye; production and sales, Olof Carlstein; Denmark region, Viggo J. Rasmussen; Norway region, Johan Nerdrum. Vice-presidents: Sweden region, Arne Wickberg; secretary-general, Erik Norman; asst. to president, P. O. Edén; sales, Karl A. Kristiansen; technical services, Knut Hagrup; operations, Povl Jensen; overhaul and maintenance, Björn Törnblom; engineering, Birger Holmer.

SPAIN

Aviaco (Aviacion y Comercio, S.A.)—Aduana, 33, Madrid, 14.

Founded in 1948, Aviaco flies schedules within Spain and to North Africa, France, Portugal, Belgium and the U.K.

AIRCRAFT: 4 Convair 440, 4 D.H. Heron, 3 Bristol 170.

MANAGEMENT: Vice-president, Julián Rubio López; managing director, Emilio Gil Cacho; admin. manager, José Inchausti Balseiro; operations manager, Carlos Texidor Rodriguez; commercial manager, Francis MacLennan Arregui.

Iberia (Lineas Aereas de Espana).—Avenida América, 2, Madrid.

The predecessor of Iberia was formed in 1938. In 1940 it was incorporated with 51% Government capital. In 1944 the Government became the sole holder of stock, apart from up to 25% which could be held by Spanish shipping. Iberia flies an internal network and internationally to points in Europe, to North and West Africa, to South and Central America and to New York.

AIRCRAFT (Oct., 1961): 3 DC-8, 7 L-1049 E/G, 7 Convair 440, 7 DC-4, 14 DC-3, 4 Bristol 170; on order 4 Caravelle VIR.

MANAGEMENT: President Tomas Delgado; general manager, Cesar Gómez Lucia; operations manager, J. M. Ansaldo; secretary-general, Juan B. Viniegra.

SWEDEN

Linjeflyg A.B.—Bromma Airport, Bromma 10, Stockholm.

This company was formed in 1957 to operate domestic services. It succeeded Airtaco, which had been operating a service, primarily for newspaper delivery, since 1950. By 1955, control of the company had been obtained by "Dagens Nyheter," which has retained a 33⅓% interest. "Stockholms Tidningen" holds 8⅓%, A.B. Svenska Pressbyran 8⅓% and S.A.S. 50% of the capital.

AIRCRAFT (mid-1961): 5 Convair 340/440, 8 DC-3.

MANAGEMENT: Chairman, Olle Karleby; president, Sven Ostling; asst. to president, Bo Nilsson; technical and operations manager, Ake Weimar; manager, traffic and sales, Sten Sandberg; manager, flight operations, Torvald Andersson; commercial manager, C. O. Munkberg.

SWITZERLAND

Swissair—Swiss Air Transport Co., Ltd.—P.O. Box 929, Zurich 1.

In 1931 Ad Astra Aero (founded in 1919) and Balair (founded in 1925) merged to form Swissair in which 70% of the capital is held by Swiss citizens and 30% by the Confederation, the Cantons and communities. In Europe, Swissair serves all the main capitals, including Prague, Belgrade and Warsaw, and services are also flown to major destinations in the Near and Middle East. Long-haul services are operated to New York, Rio de Janeiro, Buenos Aires and Tokyo.

AIRCRAFT (mid-1961): 3 DC-8, 4 DC-7C, 6 DC-6B, 4 Caravelle (leased from S.A.S.), 11 Convair 440, 4 DC-3; on order, 7 Convair 990 (2 for S.A.S.), 4 Caravelle.

MANAGEMENT: Chairman, Ernst Schmidheiny; dep. chairmen, Prof. Eduard Amstutz and Edgar Primault; president, Dr. Walter Berchtold; exec. vice-president, Armin Baltensweiler. Vice-presidents: finances and economics, Eugen Groh; traffic and sales, Hans Aeppli; operations, Robert Fretz; engineering and maintenance, Franz Roth; secretary-general, Dr. Heinz Haas; special duties, Isidor Lack.

TURKEY

Turk Hava Yollari, A.S.—Nesli Han, Galata, Istanbul.

T.H.Y. was formed in 1956 to take over from Turkish State Airlines (Devlet Hava Yollari) which was founded in 1933 and was originally a unit in the Air Force. It is financed by Government and private capital. It operates over an extensive domestic network and to Nicosia, Beirut, Athens and Rome.

AIRCRAFT (mid-1961): 21 DC-3, 7 D.H. Heron, 4 Viscount 794; 5 F-27.

MANAGEMENT: General manager, Ulvi Yenal; asst. general manager, Hüseyin Unsal. Managers: operations, Sulphi Iscen; technical, Hüseyin Yegin; commercial, Cemal Ozcr·elek.

UNION OF SOVIET SOCIALIST REPUBLICS

Aeroflot (Chief Administration of the Civil Air Fleet under the Council of Ministers of the U.S.S.R.)—Uliza Razina 9, Moscow.

The State-controlled airline of the U.S.S.R., Aeroflot is responsible for all civil aviation operations and development. It was established in 1932, in succession to Dobrolet, as the multinational Soviet airline, though the Mongolian Republic has its own air transport administration. Until Aeroflot started to operate outside the U.S.S.R. and China, very little was known about its fleet or its organization, though a large domestic network had been built up. During the past four years the development of competitive turbine-engined aircraft has led to a considerable expansion of international operations.

No statistics are available to measure Aeroflot's work, but the figures published so far show the operations to be on a large scale—but not a phenomenal scale when compared, for instance, with the "big four" airlines of the U.S.A. The Aeroflot route network is the longest of any single operator and in 1959 a total of 20 million passengers—50% more than in 1958—was carried. International services are now operated to Amsterdam, Belgrade, Brussels, Bucharest, Budapest, Berlin, Cairo, Copenhagen, Delhi, Helsinki, Kabul, London, Paris, Peking, Prague, Pyongyang, Sofia, Stockholm, Tirana, Ulan-Bator, Vienna and Warsaw. With its turboprop Tu-114 now flying on the 8,000-km. non-stop Moscow-Khabarovsk route (covered in 9 hr.), Aeroflot certainly has the World's biggest transport aeroplane in service.

AIRCRAFT (passenger accommodation in parentheses): Tu-114 (220T), Tu-104A (16F, 54T), Tu-104B (100T), Il-18 (8F, 72T), An-10 (100T), An-24 (40T), Il-12 (18T), Il-14M (24T), Li-2 (15T).

MANAGEMENT: Chief of civil aviation, Col.-Gen. E. F. Loginov; first deputy chief, Lt.-Gen. Stchetchikov; deputy chief, Maj.-Gen. Bashkirov; chief of international air services department, V. M. Danilitchev.

UNITED KINGDOM

Air Safaris, Ltd.—Gatwick Airport South, Horley, Surrey.

Formed on Mar. 1, 1960, this is a limited liability company with a fully paid up share capital of £100,000. Don Everall (Aviation), Ltd., of Birmingham, was merged with Air Safaris earlier this year. Last week Air Safaris announced that it was suspending operations.

AIRCRAFT: 9 Viking, 5 Hermes.

MANAGEMENT: Directors: W. E. Hamilton, Capt. C. M. de Bouneviallc, A. J. Stocks, C. V. Ody and D. Everall; engineering superintendent, D. A. K. Haselum; administrative and personnel officer, A. H. J. Vickers; chief accountant, T. J. A. O'Callaghan.

B.K.S. Air Transport, Ltd.—Berk House, Baker Street, London, W.1.

Formed in 1952 as B.K.S. Aerocharter, B.K.S. operates a large network of scheduled services within the British Isles and to Europe. In addition the company also operates a vehicle ferry between Liverpool and Dublin.

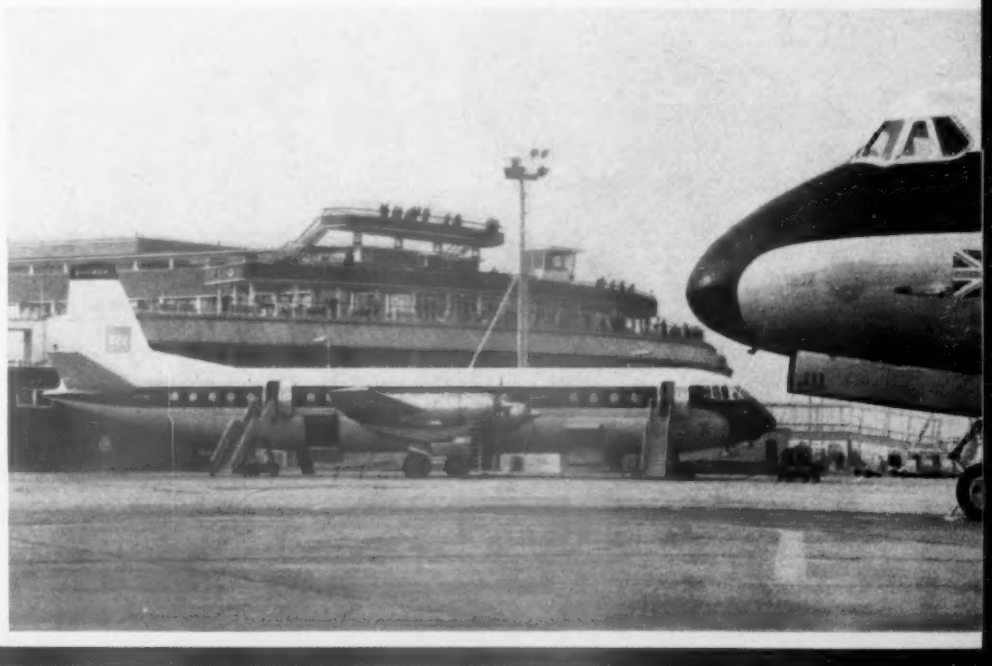
AIRCRAFT (Sept., 1961): 2 Viscount 707, 4 Elizabethan, 4 DC-3 and 3 Bristol 170; on order, 5 Avro 748.

MANAGEMENT: Directors: C. J. Stevens (managing), J. W. Barnby. Commercial manager, A. Selby-Lowndes; commercial manager, scheduled services, G. W. Corbin; chief pilot, H. W. Ayre; sales manager, J. B. Latto.

British Aviation Services, Ltd.—Silver City House, 62 Brompton Road, London, S.W.3.

B.A.S. embraces Silver City Airways, Ltd. (see entry), Britavia, Ltd., Aquila Airways, Ltd., Air Kruise, Ltd., Manx Airlines, Ltd., Manx Aero Engineering, Ltd., Inclusive Tours, Ltd., Dragon Airways, Ltd., Roadair-Railair, Ltd., Silver Arrow, Ltd., British Aviation Services (Engineering), Ltd. Shareholdings are: P and O Group (70%), Eagle Star (20%) and Cable and Wireless (Holdings), Ltd. (10%).

DIRECTORS: Eoin C. Mckie, C.B.E. (chairman), Sir Donald F. Anderson, Sir Arthur Vere Harvey, C.B.E., Air Vice-Marshal S. D. MacDonald, C.B., C.B.E., D.F.C. (deputy managing), Gen. Sir



One of B.E.A.'s Vanguards on the apron in front of the Queen's Building, London (Heathrow) Central.

Airlines of the World . . . .

EUROPE—

United Kingdom (contd.)

Edwin L. Morris, K.C.B., O.B.E., M.C. (deputy chairman), A. J. Maitland Makgill Crichton, C. M. Fox, O.B.E., T.D., R. G. Grout, Sir Edward Wilshaw, K.C.M.G.

British European Airways Corporation.—Bealine House, South Ruislip, Middx.

B.E.A. was formed on Aug. 1, 1946, following the Civil Aviation Act. It is responsible for most of the British scheduled passenger, mail and freight services to the main cities of Europe and within the U.K. The Corporation operates internationally to 82 points in Europe, including Warsaw, Prague and Moscow. Services are operated in a consortium agreement with Olympic Airways to Tel Aviv, Ankara, Istanbul, Nicosia and Beirut from the cities of Western Europe; the routes to Kuwait, Bahrain, Doha and Damascus are operated by agreement with Cyprus Airways. The principal cities in the U.K. are linked with London, and there is a network of domestic routes throughout Scotland.

AIRCRAFT (mid-1961): 14 Comet 4B, 11 Vanguard, 23 Viscount 701, 20 Viscount 802, 19 Viscount 806, 7 DC-3/Leopard freighter, 3 D.H. Rapide, 2 D.H. Heron, 2 S-55, 2 Bell 47, 1 Sycamore; on order, 9 Vanguard, 24 D.H. 121 Trident, 3 A.W. Argosy.

MANAGEMENT: Chairman, Lord Douglas of Kirtleside, G.C.B., M.C., D.F.C.; deputy chairman, Sir John Keeling; chief executive, Anthony H. Milward, C.B.E.; director and chief engineer, B. S. Shenstone; commercial and sales director, P. C. F. Lawton; financial controller, R. L. Weir, O.B.E.; flight operations and communications director, J. W. G. James, O.B.E.; traffic director, E. P. Whitfield, O.B.E.; personnel director, C. A. Herring; secretary, H. A. Marking.

British Overseas Airways Corporation.—B.O.A.C. Headquarters, London Airport, Hounslow, Middx.

B.O.A.C. was formed under the B.O.A. Act of 1939 to take over Imperial Airways and British Airways on April 1, 1940. Its history thus goes back, through Imperial Airways and its predecessors, to 1919. The Corporation's routes east and south from the U.K. and Europe serve the Near East, Africa, the Middle East, Pakistan, India, Ceylon, Burma, Thailand, Malaya, Singapore, Hong Kong, Indonesia, the Philippines, Japan and Australia. Services westwards operate to Canada, to the U.S.A. east and west coast, and across the Pacific to Tokyo and Hong Kong, to the Caribbean and to Venezuela and Colombia. Direct 707 services are also operated between the Bahamas and Peru. South Atlantic services to and through South America were restarted in 1960.

B.O.A.C. uses Britannia 102s for some of its services to East and Central Africa. One is seen here at Salisbury Airport, S. Rhodesia.

AIRCRAFT (mid-1961): 15 Boeing 707-435, 19 Comet 4, 17 Britannia 312, 14 Britannia 102, 8 DC-7C, 2 DC-7C/F; on order, 15 VC10, 30 Super VC10.

MANAGEMENT: Chairman, Sir Matthew Slattery, K.B., C.B.; deputy chairman, Sir Wilfred Neden, C.B., C.B.E.; managing director, Sir Basil Smallpeice, K.C.V.O.; chairman, B.O.A.C. Associated Companies, Keith Granville, C.B.E.; chief engineer, C. Abell, O.B.E.; general manager, eastern routes, B. W. Bampfylde; director, personnel and medical services, Dr. K. G. Bergin; financial comptroller, K. W. Bevan; general manager, planning, W. Bray; chief of flight operations, Capt. D. I. Peacock, O.B.E.; chief Press and information officer, F. C. Gillman, O.B.E.; general manager, southern routes, D. H. Glover, M.B.E.; commercial director, G. H. C. Lee; general manager, western routes, J. R. Stainton; legal adviser and secretary to the Corporation, K. H. Staple, O.B.E.

British United Airways, Ltd.—35 Piccadilly, London, W.1.

British United was formed on July 1, 1960, when the Airwork Group merged with Hunting-Clan Air Transport. The combine includes the companies formerly known as Airwork, Air Charter, Airwork Helicopters (previously Fison-Airwork), Bristow Helicopters, Hunting-Clan, Morton Air Services, Olley Air Service and Transair. Operations are under three separate divisions: Air Transport, Helicopter and Overseas Contracts. B.U.A. has other subsidiaries which retain their names and operating individuality, including Airwork Services, at Hurn (main engineering base), Panshanger and Perth (Airwork Services training school); Channel Air Bridge (see later) and Aviation Traders (Engineering) at Southend; and Straits Air Freight Express of New Zealand. Associates include Commercial Air Services, Johannesburg and Air Carriers, Southern Rhodesia. Shareholders are: British and Commonwealth Shipping Co. (Aviation) and The Clan Line Steamers (31.72%); Furness, Withy and Co. (19.47⅞); Blue Star Line (19.47⅞); Broadminster Nominees (Whitehall Securities) (9.73⅞); Guinness, Mahon Nominees (9.73⅞); Hunting Aviation Management (7.79⅞); minorities (2.09⅞).

Operations include scheduled passenger services to East, Central and West Africa; others to the Canary Islands, Gibraltar, Milford Haven, Swansea, Rotterdam, Le Touquet and the Channel Islands; the Channel Air Bridge vehicle and passenger ferry services (see right); services to Rome, Athens, Cairo and Khartoum/Beirut (on behalf of Sudan Airways); the all-freight Africargo services to Germany, Malta, Khartoum, East, Central and South Africa. B.U.A. also assists in the operation of Sierra Leone Airways. Contract services include trooping flights, inclusive tour services throughout Europe and other long-term freight and passenger operations.

AIRCRAFT (Sept. 1961): 6 Britannia, 2 DC-6C, 11 Viscount, 5 DC-4, 13 Bristol 170, 3 DC-3, 3 D.H. Heron, 6 D.H. Dove, 1 D.H. Rapide, 16 Whirlwind, 4 Widgeon, 7 Bell, 23 Hiller, 2 Twin Pioneer, 2 Twin Bonanza, 1 D.H.C. Beaver.

MANAGEMENT: Executive directors: M. D. N. Wyatt, C.B.E. (chairman); A. E. Bristow (Helicopter Division); R. L. Cumming (secretary); F. A. Laker (Air Transport Division); T. W. Morton (Overseas Contracts Division); R. W. Cantello (manager, Airwork Services). Air Transport Division executives: general manager, P. F. Lewindon; general manager, flight operations, E. N. Jennings, O.B.E.; general commercial manager, G. G. Carroll; general traffic manager, J. Byrne; chief engineer, W. A. Richardson. Helicopter Division executives (Redhill): general manager, G. Russell Fry; operations manager, A. G. Green; agricultural manager, J. E. Harper; chief engineer, J. N. Woolley (see right for Channel Air Bridge executives).

Cambrian Airways, Ltd.—Cardiff (Rhoose) Airport, near Barry, Glam.

Cambrian was formed in 1935 as Cambrian Air Services; scheduled operations started in 1948; the present name was adopted in 1955. In 1956 B.E.A. and Cambrian signed a 10-year operating agreement and in 1958 B.E.A. acquired a 33⅓% interest. The company concentrates on scheduled services serving South Wales and the West of England. Routes link these areas with Manchester/Liverpool and the Channel Islands, and externally with Paris, Dinard, Belfast and Dublin. Cork and London came into the network on Oct. 16, 1961.

AIRCRAFT (Aug., 1961): 8 DC-3.

MANAGEMENT: Chairman, J. Morgan; managing director, L. B. Elwin; secretary, L. G. Roberts; operations manager, B. J. T. Callan; chief pilot, G. A. Perrott; chief engineer, R. H. Boutcher.

Channel Air Bridge, Ltd.—21 Wigmore Street, London, W.1; and Southend Airport.

A British United Airways company, C.A.B. operates scheduled vehicle-ferry, passenger and freight services between Southend and Calais, Ostend and Rotterdam and non-scheduled I.T. flights mainly to European destinations. British Government approval has recently been granted for scheduled passenger services between Southend and Ostend and for vehicle-ferry services to Basle and Geneva. Subject to Swiss Government approval, services to Switzerland with ATL-98 Carvairs will be operated from spring next year. The company also plans to operate vehicle-ferry services to Bremen, Dusseldorf, Strasbourg and Lyon. Rail-air-rail services with British and Belgian National Railways are operated between London and Belgium.

AIRCRAFT (Sept., 1961): 8 Bristol 170 Mk. 32, 1 Bristol 170 Mk. 31; on order, 10 ATL-98 Carvair (delivery from Dec., 1961).

MANAGEMENT: Directors: M. D. N. Wyatt, C.B.E. (chairman); F. A. Laker, R. L. Cumming, A. F. Nickalls (chief accountant); D. A. Whybrow (general manager). Commercial manager, H. E. Cross; sales manager, G. P. Parselle; project and development manager, A. T. Pugh.

Cunard Eagle Airways, Ltd.—London Airport, Hounslow, Middx; and Marble Arch House, 40 Edgware Road, London, W.2.

This company was originally formed in 1948 as Eagle Aviation, to operate passenger and freight services. In July, 1960, the name of the company was changed to Cunard Eagle Airways, as a result of the company's association with the Cunard Steamship Co. It operates regular services from London to Bermuda-Nassau-Miami, and from Bermuda to Nassau and New York; from London to Dinard, Innsbruck, La Baule, Luxembourg, Ostend, Perpignan, Pisa, Rimini, and Jersey; from Manchester to Bergen, Copenhagen, Hamburg, Ostend, Pisa and Rimini; and from Birmingham to Palma. The company also operates inclusive tour services and World-wide charter and Government trooping services.

A Derby Airways DC-3 at Luton Airport—one of the points served in this operator's domestic network.

Jersey Airways is using two leased H.P. Herald 100s pending the delivery of six Herald 200s

AIRCRAFT (Sept., 1961): 2 Britannia, 4 DC-6C, 4 Viscount, 4 Viking; on order, two Boeing 707-420.

MANAGEMENT: Chairman and managing director, H. R. Bamberg; dep. managing director, M. A. Guinane. Directors: N. Ashton Hill, M.B.E., T.D.; Sir John M. Brocklebank, Bt.; F. F. A. Burden, M.P.; William Donald, C.B.E.; Major-General C. G. B. Greaves, C.B., C.B.E.; G. D. Peacock; J. H. Sauvage, D.S.O., D.F.C.; Ronald H. Senior, D.S.O., T.D. Commercial manager, D. J. Platt; charter manager, W. H. Hodgson; sales manager, J. A. Lovegrove; reservations manager, V. J. Debenham; tariffs manager, N. Thompson; publicity manager, J. A. Loader.

Dan-Air Services, Ltd. — Bilbao House, 36/38 New Broad St., London, E.C.2.

Formed in 1953, Dan-Air now operates the following scheduled services: Cardiff-Bristol-Plymouth-Liverpool - I.o.M. - Newcastle - Dundee; London-Dundee; London-Plymouth; London-Jersey; Bristol-Basle; and Glasgow-I.o.M.

AIRCRAFT (Sept., 1961): 4 York, 3 Elizabethan, 3 Bristol Wayfarers, 3 DC-3, 2 D.H. Dove.

MANAGEMENT: Directors: F. E. F. Newman, M.C.; J. W. Davies; E. O. Wallis; L. E. Moore.

Derby Aviation, Ltd. (Derby Airways).—78 Buckingham Gate, London, S.W.1, and Derby Airport, Derby.

Derby Aviation was formed in 1949. Scheduled services are operated from Derby, Northampton, Cambridge, Luton and Staverton (Gloucester-Cheltenham) to the Channel Islands; and from Derby to Belfast, Cork, Dublin, Glasgow, Ibiza, Isle of Man, Luxembourg, Ostend and Rotterdam; from Birmingham to Cork and Ostend; from Bristol and Cardiff to Albenga, Luxembourg, Ostend and Palma; from Leeds/Bradford to Glasgow; from Luton to Dublin; and from Swansea to Ostend.

AIRCRAFT (mid-1961): 8 DC-3, 2 Anson.

MANAGEMENT: Chairman, Gp. Capt. C. A. B. Wilcock, O.B.E., A.F.C., M.P. Directors: Wg. Cdr. H. A. Roxburgh, R. R. Paine and D. W. T. Sullivan. Secretary, M. Ager; commercial manager, T. A. J. Mayo; chief accountant, A. C. Felts; traffic manager, D. Aldridge; chief pilot, Capt. T. Pike; operations supt., Capt. S. D. Fenton; chief engineer, K. W. Felts.

Don Everall (Aviation), Ltd.—Now merged with Air Safaris.

East Anglian Flying Services, Ltd. (Channel Airways).—The Airport, Southend-on-Sea, Essex.

This company was formed in 1946. Scheduled services are operated from Ipswich, Rochester, Southend, Shoreham and Portsmouth to the Channel Islands, Paris (not from Ipswich), Ostend, Rotterdam and Le Touquet.

AIRCRAFT (mid-1961): 4 Viking, 6 DC-3, 2 Bristol 170, 2 D.H. Dove, 2 D.H. Rapide.

MANAGEMENT: Managing director, R. J. Jones, A.F.C.; operations manager, A. E. Hugo Parsons; chief engineer, T. Atkins.

Jersey Airlines (Airlines (Jersey), Ltd.).—States Airport, Jersey, C.I.

Formed in 1948, this company operates services from the Channel Islands to London, Southampton, Bournemouth, Exeter, Dublin, Coventry, Manchester, Paris, Nice and points in Northern France, and directly between U.K. provincial centres and France. Until recently B.E.A. had (through the Jersey Airlines Development Corporation) a 25% shareholding; this is being relinquished.

AIRCRAFT (mid-1961): 2 H.P. Herald (on lease), 8 DC-3, 4 D.H. Heron, 1 D.H. Rapide; on order, 6 H.P. Herald 200.

MANAGEMENT: Chairman and managing director, M. L. Thomas; director of operations, Capt. B. W. Gardiner; director of engineering, T. C. Chandler; company secretary, H. F. Popham; chief pilot, Capt. J. A. Spencer; chief engineer, J. M. Paisnel; chief accountant, R. J. K. Farrow; commercial manager, H. I. Allan; commercial supt., J. R. Jenkins.

North-South Airlines, Ltd.—Leeds-Bradford Airport, Yeadon, Yorks.

North-South operates summer services between Leeds/Bradford, Exeter, Bournemouth and Sandown, I.o.W. As we go to press North-South is in process of reorganization.

AIRCRAFT (mid-1961): 1 D.C.3, 1 Bristol 170.

MANAGEMENT: General manager, R. W. Lea.

Silver City Airways, Ltd.—Silver City House, 62 Brompton Road, London, S.W.3.

Silver City Airways (formed in 1946 to operate services to Australia) is best known for its vehicle and passenger ferry service (started in July, 1948) which operates all the year round from Lydd (Ferryfield), near Dungeness, to Le Touquet, Calais and Ostend; from Hurn (Bournemouth) to Cherbourg and the Channel Islands; and, in the summer only, from Lydd to Deauville. Passenger services flown all the year round are from Blackpool to Newcastle, Amsterdam and Dusseldorf; between Glasgow and the Isle of Man; between Blackpool, Belfast and Dublin; between Blackpool and the Isle of Man; between Glasgow, Blackpool, Leeds/Bradford, Newcastle, Birmingham, Glasgow, Manchester and Le Touquet. Seasonal services are flown from Blackpool to Jersey; from Newcastle to the Isle of Man; from Leeds/Bradford to Jersey and the Isle of Man; and from Birmingham, Glasgow, Edinburgh and Carlisle to the Isle of Man. A London-Paris coach-air-rail service, the Silver Arrow, is also operated seasonally.

AIRCRAFT (Sept., 1961): 11 Bristol 170 Mk. 32, 6 Bristol 170 Mk. 21, 10 DC-3, 4 H.P. Hermes, 1 D.H. Dove.

MANAGEMENT: Chairman, Eoin C. Mekie, C.B.E.; joint managing directors, C. M. Fox, O.B.E. (financial) and W. G. Franklin; secretary, A. E. Barnes; operations and technical director, M. D. Day; traffic director, W. E. Hogsflesh; director and general manager (Northern Area), R. V. Baker; director, L. J. Ottensooser.

Skyways, Ltd., and **Skyways Coach Air, Ltd.**—7 Berkeley Street, London, W.1.

The present Skyways originated in the Lancashire Aircraft Corporation, which was formed in 1942. In 1952 L.A.C. bought Skyways (formed in 1939) and this became the major operating section of the organization. Skyways operates direct scheduled services from London to Tunis and Malta and scheduled animal transport services between the U.K. and France. Coach Air operates services London-Lympne-Beauvais-Paris; London-Lympne-Vichy-Montpellier; and London-Lympne-Lyons. Services are also flown to Tours.

AIRCRAFT (Aug., 1961): 4 L-749, 5 H.P. Hermes, 10 York, 6 DC-3; on order 3 Avro 748.

MANAGEMENT: Chairman, Sir Wavell Wakefield, M.P.; managing director, Eric Rylands; directors, C. F. Dickson, O.B.E., David Gaunt. General managers: commercial, Cdr. D. Macqueen; Coach Air, R. Birkett, M.V.O., D.F.C.; financial, V. J. Doel. Secretary, D. J. Davies; head, public relations, and asst. to managing director, Mrs. E. Whitaker; operations manager, Capt. J. S. Michie.

Starways, Ltd.—Liverpool Airport, Liverpool, 24.

Primarily a charter operator and formed in 1948, Starways started scheduled services in 1955 and operates between Liverpool and London; Liverpool and Glasgow; and, seasonally, from Liverpool to Dinard and Ostend; from Glasgow, Manchester, Liverpool, Newcastle, Leeds and Birmingham to Exeter and Newquay; and from London to Newquay.

AIRCRAFT (Oct., 1961): 3 DC-4, 3 DC-3, 1 Viscount 708.

MANAGEMENT: Chairman, F. H. Wilson, O.B.E.; directors, J. A. Wilson, A. M. Wilson, Capt. G. K. Leigh, G. C. Gates; commercial manager, B. C. L. Johnson.

Tradair, Ltd.—Prince Rupert House, 64 Queen Street, London, E.C.4.

Formed in 1957, Tradair's operations include scheduled freight services to various points in Europe, extensive I.T. programmes and contract and other charter flights. Its main base is Southend Airport.

AIRCRAFT (Oct., 1961): 2 Viscount 707, 2 Viking Mk. 1B, 2 Viking Mk. 2, 2 Viking Mk. 1B (freighters).

MANAGEMENT: Joint managing directors, E. S. Hanks and L. N. Monnickendam; personal assistants to managing director, H. H. Porter and Gp. Capt. J. G. Glen; chief pilot and operations manager, Capt. V. J. Stimpson.

One of Cie. Air Transport's Bristol 170 Mk. 32s, "Onze Novembre", at Ferryfield. C.A.T. now operates in pool with Silver City Airways.

(*Continued from page 590*)

CHEAPER FREIGHT TARIFF.—Subject to C.A.B. approval, T.W.A. will introduce a new freight tariff for U.S. domestic shipments with reductions of up to 47%. The new rates provide for breaks at 1,000, 2,000, 3,000, 5,000 and 10,000 lb., with the greatest savings for the largest consignments.

A.T.C. STANDARDS. — National standards for conducting flight operations on and around all airports in the U.S. which have control towers will come into operation on Dec. 26. These air traffic control rules, which will apply to 465 airports, are aimed at flight safety and aircraft noise reduction.

TAX CONCESSION.—A recent meeting of the Italian Cabinet gave approval to a Bill indefinitely extending the concession granted to Italian scheduled operators whereby they are exempted from paying tax on aircraft fuel and lubricants, on flight instruments and certain categories of spares.

FIRE RISKS.—A recent Airline Pilots' Association survey gives only 8% of American airports a good fire-protection rating. Thirty-five per cent. have some protection and 57% "no protection."

SPEKE EXTENSION. — Work has started on improvements at Liverpool's Speke Airport. Runway 08/26 (5,127 ft.) is to be strengthened, resurfaced and extended by 500 ft. to the south-west (i.e., towards the Mersey). Meanwhile new taxiways will be laid down and the apron will be strengthened. Details of changes in runway declared distances and in lighting will be notified in Class I Notams.

NAVIGATION RESEARCH.—The F.A.A. has placed a $70,000 contract with the University of Michigan's Institute of Science and Technology for research on long-range navigation equipment. The institute will study inertial systems, satellites, VLF radio and aircraft heading references in the course of a 10-month programme.

GENOA AIRPORT.—As no land for an airport was available near Genoa, an artificial peninsula is being built to carry the runway on concrete caissons in the sea adjacent to the main dock area. Part of the 7,500-ft. runway will be open next May and the terminal towards the end of the year.

NAIROBI EXTENSION.—Work has started on improvements at Nairobi's Embakasi Airport, including the extension of the runway. This (03/24) will be lengthened at the north-east end from 10,000 ft. (plus 800 ft. of stopway) to 12,500 ft. (plus 1,000 ft. of stopway).

EAST RIDING AIRPORT.—A working committee has been set up by the local authorities in Goole, Beverley, Castleford, Doncaster, Knottingley, Pontefract, Scunthorpe and Selby to investigate the development of R.A.F. Pollington as a civil airport. Representing a population of nearly two millions, these authorities have expressed dissatisfaction with the location of Yeadon Airport and "lack of progress" there.

JOHANNESBURG TERMINAL.—A striking new building has recently been completed as the town terminal in Johannesburg for South African Airways and its pool partners — B.O.A.C., E.A.A.C., C.A.A. and Qantas. It is circular and includes only two levels. An administrative block for S.A.A. is under construction on an adjacent site.

HOUSTON AIRPORT.—A total of U.S. $55,260,000 will be spent by the end of 1966 to develop a 6,000 acre Jetero International Airport at Houston, Texas. An additional $28,740,000 will be spent by 1975. First phase will cover construction of two runways, an annular planform terminal building and access roads. Phase two adds a third runway and expands terminal facilities. One runway will be 8,000 ft. and the other two 9,400 ft.; extensions to 12,000 ft. are visualized. Location of the airport is 15 miles north of the business district. Present Houston airport would eventually become a private owner terminal.

SILVER CITY LOSS.—The two pilots were killed, but seven passengers and the steward survived, when a Silver City Bristol 170 overshot the runway and crashed on Nov. 1 when attempting to land at Guernsey in poor visibility. It was the first fatal accident on Silver City car ferry operations.

RECIFE ACCIDENT.—Forty-eight of the 85 occupants, including seven of the crew of nine, died when a Panair do Brasil DC-7 hit a hill while approaching Recife on Nov. 1. Some reports speak of an engine on fire before the accident.

News About People

N.P.L. EXECUTIVE.—Dr. J. V. Dunworth has been appointed deputy director, National Physical Laboratory, in succession to Dr. G. Macfarlane who is shortly to become director of the Royal Radar Establishment, Malvern. Dr. Dunworth is at present deputy director of the Atomic Energy Establishment.

IATA PRESIDENT.—Mr. J. F. Dempsey, general manager of Aer Lingus and Aerlinte Eireann, who has been elected president of IATA for 1962-63. The Association's 1962 A.G.M. will be in Dublin with the Irish airline as host.

JOINING TEAL.—Air Marshal Sir Andrew McKee has resigned from the board of the de Havilland Aircraft Co. of New Zealand, Ltd., to take up an appointment on the Board of TEAL. He was A.O.C.-in-C. of Transport Command from 1953 until 1959.

ROTAX APPOINTMENTS. — Mr. R. H. Woodall, technical director of Rotax, Ltd., since 1949, is now assistant general manager with specific responsibility for sales and engineering. Mr. J. H. Rea is appointed to the board and takes over as technical director.

SPACEMEN.—Hawker Siddeley now have six people actively working on space problems, following the curtailment of the Astronautics Section of the Advanced Projects Group. They are Mr. G. P. Coates (section leader), B. Buss, S. R. Dauncey, B. Stewart, J. F. Swale and L. W. Steines (who is with the existing D.H. Weapons Research Group).

MASTER PILOTS. — Capts. John Bowden-Parkes (Sabena) and Geoffrey A. Myers (Sudan Airways) have been awarded Master Air Pilot Certificates by GAPAN.

"HEPOLITE" DIRECTOR. — Mr. Allan Rowntree, general manager of Hepworth and Grandage (Yeadon), has been made a director of the company.

BIRTHDAY TREAT.—To celebrate his 80th birthday on Oct. 31, Dr. A. P. Thurston (centre) went for a flight from Redhill in an Airedale flown by Mr. Peter Masefield (right). Planning the flight with them is Mr. A. Golding Barrett.

TEST PILOT.—Mr. J. L. Barnes has joined the de Havilland Engine Co. at Hatfield as a test pilot. He will be concerned with the Gyron Junior - powered Buccaneer and Javelin test-bed and the Gnome Whirlwind.

CONSULTANT TO WESTLAND.—Westland Aircraft have engaged Mr. C. H. Latimer-Needham as a consultant to be primarily concerned with ground effect machines.

CARIBBEAN APPOINTMENT.—Mr. R. M. Hilary has been appointed resident representative for B.O.A.C. Associated Companies in the Eastern Caribbean. He served with Imperial Airways before the war and subsequently with B.O.A.C. before becoming commercial manager of D. Napier and Son, Ltd., in 1953.

HARRY WOODHEAD.—The British-born president of Consolidated-Vultee during the war-time and immediately post-war period, Mr. Harry Woodhead, died on Oct. 30 at the age of 72.

AIR VICE-MARSHAL McNAMARA.—We regret to record the death on Nov. 2 of Air Vice-Marshal F. H. McNamara, V.C., C.B., C.B.E., aged 67. He won his V.C. for conspicuous bravery in Egypt in 1917 as a Lieutenant with the Australian Flying Corps. Retiring from the R.A.A.F. in 1947 he joined the National Coal Board in London holding various administrative positions until retiring in 1959.

THE AEROPLANE and ASTRONAUTICS
NOVEMBER 9, 1961

The de Havilland TRIDENT

(Rolls-Royce Spey by-pass engines)

REMEMBER POPPY DAY

The short-haul jet airliner for long-term planning

The world's leading design for a second-generation jet

The first three-jet conception

The first short-haul airliner engineered for automatic landing

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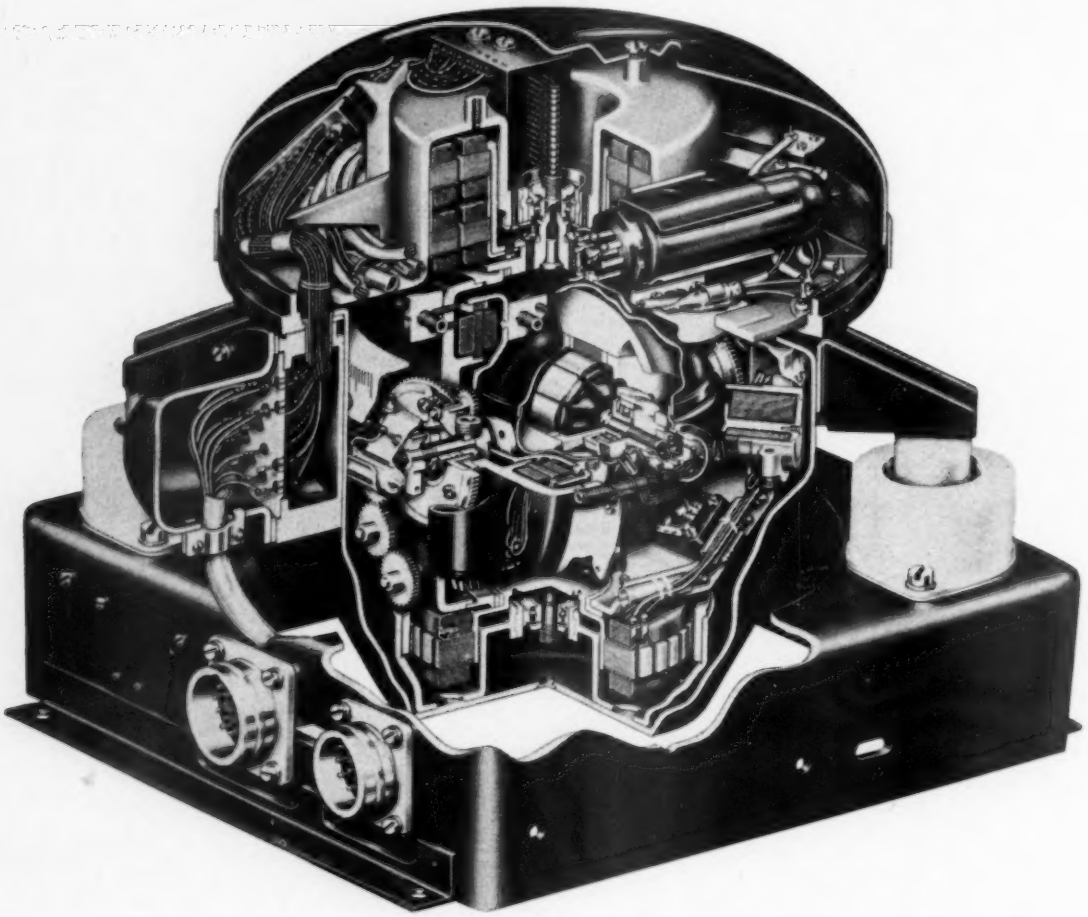
Less than 1° per hour...

...the new Sperry "Rotorace"* gyros have a free drift rate of less than 1° per hour which provides the extremely accurate directional reference required for the new high performance aircraft for both military and civil operation. They are now in quantity production in the United States, Canada and England to meet a rapidly increasing demand.



The new C.L.11 "Gyrosyn"* compass incorporates a "Rotorace" gyro to provide a highly accurate gyro-magnetic compass which can also be used in the unslaved mode as a free directional gyro reference. Monitoring of all ancillary equipment can be provided in either mode as required.

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OPtional Reading—19

AIRCRAFT				ASSUMPTIONS (normal distributions)			
Vs stall (full flap)	100 kt.	Wing Area	2,500 sq. ft.	Gust Effect	6 kt.	Standard Deviations	
Level flight 1g stall (full flap)	104	Flap Area	500 sq. ft.	A.S.I. Reading Error	15	.34 × mean wind	
Buffet regime (low speed range) stall + ..	5	Landing Weight	150,000 lb.	Weight Error (1·5% of Wt.) ..	30	2 kt.	
		Wing Loading, level flight	50 lb./sq. ft.			1	
				Statistical Combination of above	3 kt.		
				For winds of	5.5		
					10.2		

M = Probability less than one in a million (10^{-6})
Italic type = Probability greater than one in 10,000 (10^{-4})

	Approach Speed at end of Round-out (flare) Manœuvre																							
	130 kt. (1.3Vs)								140 kt. (1.4Vs)								150 kt. (1.5Vs)							
Loading during round-out (g)*	.15		.23		.3				.15		.23		.3				.15		.23		.3			
Round-out wing loading (lb./sq. ft.) ..	57.50		61.53		65.00				57.50		61.53		65.00				57.50		61.53		65.00			
Round-out stall (kt.)	111		115		119				111		115		119				111		115		119			
(A) Margin above round-out stall 1 kt. ..	19		15		11				29		25		21				39		35		31			
(B) Margin above round-out buffet (kt.)	14		10		6				24		20		16				34		30		26			
Mean surface winds (kt.)	6	15	30	6	15	30	6	15	30	6	15	30	6	15	30	6	15	30	6	15	30	6	15	30
No. of Standard Deviations in A above ..	6.33	3.46	1.82	5.00	2.73	1.47	3.67	2.00	1.08	9.33	5.27	2.84	8.33	4.55	2.45	7.00	3.82	2.06	13.00	7.08	3.82	11.33	6.36	3.43	10.33	5.64	3.06
No of Standard Deviations in B above ..	4.67	2.54	1.37	3.33	1.82	.98	2.00	1.09	.588	8.00	4.35	2.36	6.67	3.64	1.92	5.33	2.91	1.57	11.33	6.18	3.33	10.0	5.46	2.94	8.67	4.73	2.55
Probability of encountering stall in 100 approaches	M	.028	3.44	.00003	.317	7.08	.013	2.28	14.01	M	M	.219	M	.00323	.714	M	.0066	1.97	M	M	.0066	M	M	.030	M	M	.01
Probability of encountering buffet in 100 approaches	.00015	.55	8.53	.043	3.44	16.11	2.28	13.79	27.9	M	.007	.91	M	.014	2.74	M	.181	5.82	M	M	.043	M	M	.16	M	.00035	.36

* The higher wing loadings referred to in OPtional Reading 17, viz. .43, are not included since there is some doubt whether figures of this order are reached in practice.

OPtional Reading—19

FOR those readers who have struggled along with me so far, here is my little table showing the probability of the *aircraft*, not the pilot, landing short. By this I mean that, on the basis of the assumptions given, the aeroplane will land short even though the pilot manages exactly to hit off the intended speed at the threshold.

(See table alongside.)

The figures in the table have been derived from a purely hypothetical aircraft; they are, however, thought to be representative of the modern jet. No aircraft will fit them exactly, but I do not see why a little adaptation and interpolation should invalidate the results. For example, if you have an aircraft with an honest stall, like the Caravelle (an excellent application of French logic), you could assume 5 kt. better threshold margins; if you have a propeller, you could assume 10 kt. better margins; if you have an operational procedure (as in the case of some 707s) calling for an addition to reference speed of half the headwind and all the gust, each landing will have its own probability based on the increment made to the ref. speed, and the table should be entered so much higher up; on the other hand, if you have a higher wing loading at landing weight, you will have to use your slide rule a bit, according to the formula that the stall is proportional to the square root of the full flap wing loading, and buy a little book called "Introduction to Statistical Method" to get the probabilities.

I should say that it would be in keeping with generally agreed performance standards that probabilities lower than one in a million (10^{-6}) represent safe operations and those higher than one in 10,000 (10^{-4}) unsafe; in between one can argue. If this is accepted and our figures are representative, then it will be apparent:—

That 1.3Vs ref. speeds are unsafe in all but calm conditions; that 1.4Vs ref. speeds become marginal when more than .2 *g* is pulled; and that to ignore a gust correction factor at all speeds up to 1.5Vs is also unsafe.

No doubt other deductions will spring to the mind; for example, one can see at once why the test pilot chooses a calm day for his landing distance measurements, and one can see why some jet manufacturers are clamouring for glide paths of less than 2°, so as to minimize the round-out loads. But before making further conclusions I propose to stick for a bit so as to let the figures be shot at. In the meantime I will devote the next number to looking back at a few undershoot accidents to see how they might fit in.—C.C.J.

Training the Next Generation

AS Farnborough is renowned the World over as a centre of aeronautical research and development, it is not surprising to find that the Technical College there is equipped with really up-to-date apparatus for the teaching of aerodynamics. Recently the newest of the college's equipment—a 4½ ft. x 3½ ft. closed-circuit low-speed wind-tunnel—was formally handed over. It has a maximum air speed of 150 ft./sec.

The tunnel has been designed by the college's senior students under guidance from the Low Speed Tunnels Division of the R.A.E.'s Aerodynamics Department.

Two balances are provided for measuring the model forces. One of these is used for measuring lift, drag and pitching moments and the other for side-force, rolling and yawing moments. Both of these balances are on a raised platform above the working section and are mounted on wheeled trolleys that can be moved along rails from the "parked" position to the working section.

The tunnel is powered by a 37-h.p. constant-speed 400-volt three-phase motor operating at 1,470 r.p.m. with a 1.5 : 1 fixed reduction gear to provide the necessary reduction in fan speed. The fan is a six-bladed unit some 7½ ft. in diameter having a maximum speed of 930 r.p.m. and a maximum tip speed of 350 ft./sec.

Farnborough Technical College already has a 20-in. low-speed tunnel to which the new wind-tunnel will be complementary. With this equipment students will be able to make balance measurements of the aerodynamic forces and moments on aircraft models, to investigate pressure distribution over bodies of various shapes and to make quantitative observations of the phenomena associated with subsonic aerodynamics.

This sort of experimental work is done by students in courses leading to the National Council Diploma of Technology in aeronautical engineering and to the Higher National Certificate in either aeronautics or mechanical engineering. The new wind-tunnel is also eminently suitable for "doing advanced project work of a research nature."

Autoland—The Pilot's Point of View

OVERALL reliability of both the airborne and ground components, visual cockpit monitoring devices, the possibility of incorrectly installing or connecting the "black boxes" and the more subtle point of "who's in command" were among the many matters raised by pilots at last week's Automatic Landing Forum organized by the British Air Line Pilots' Association. Attended by representatives of the electronics industry, the aircraft manufacturers, the airline operators and the Ministries in addition to BALPA members, the Conference presented an excellent opportunity for all interested parties to voice their opinions.

A strong case on why the advent of automatic landing does not seem to be viewed with any marked enthusiasm by pilots was the theme of the opening paper. Presented by CAPT. P. E. BRESSEY, chairman of the BALPA aerodrome ground aids study group, it contained four main reasons for this somewhat coloured outlook on new technical advances.

First, the lecturer said pilots tend to view with suspicion the introduction of any new device or procedure which tends to undermine their powers of command—though once it has been proved successful in everyday operations on a World-wide basis, they are willing to accept it. Secondly, pilots find that such devices tend to be introduced into operational service before initial teething troubles are overcome, and it is usually they who suffer during this "running-in" period. Thirdly, it appears that insufficient attention is being given to the overall autoland problem. And finally, even if solutions to these three doubts can be found, it still appears that automatic landings are going to be possible only with some aircraft on some runways at some airfields under some weather conditions.

Expanding on these points Capt. Bressey said that the pilot is ultimately responsible for a very valuable capital investment, the personal safety of his passengers, and is not unmindful of the fact that if anything does go wrong, he is in the end that hits first. When GCA was going through its initial troubles, pilots could always have some check as to what the controller was doing by cross-reference to some other navaid. Similarly with automatic approach couplers (which, it was stated earlier, the majority of pilots do not use) the pilot monitored the performance by his instruments and, in many cases, his critical height was higher when using the aid than when flying manually.

So far, a pilot had never allowed any aid or device to get his aircraft into such a dangerous position that he would be unable to extricate it from this situation by taking over manual control. Now for the first time he is being asked to allow a series of black boxes to manœuvre his aircraft right down to the runway surface. This means a complete reversal of his basic approach to fundamental matters of safety which has been drilled into him for many years.

Another problem for the pilot was how to keep his hand in, if the majority of landings were made on automatics.

With regard to the overall problem, Capt. Bressey said that much thought has been given to the airborne equipment proposed. We hear talk, he remarked, of failure rates of 1 in 10^{-8}, triplicated systems, triple systems, and even of duplicate ground equipment. All this will bring the aircraft safely to rest on the runway, but unless it can be safely removed fairly quickly, it is then just an obstruction preventing the next aircraft from landing.

At many major airports this "removal from the runway" involves some pretty complicated taxi routes and some even more involved manœuvring when reaching the marshalling area. How this is to be done under conditions of zero-zero visibility, no one has yet explained.

How passengers are to be removed from, or taken to, the aircraft without losing them in the fog, and how all the servicing vehicles are to do their work, are not really a pilot's worries. But unless the aircraft is to sit on the tarmac until the weather improves, all these necessary functions must be performed, and then presumably the pilot will be asked to taxi the aircraft out to the right end of the correct runway, and get it airborne. Or, Capt. Bressey asked, will all this be performed on Autotaxi and Autotakeoff?

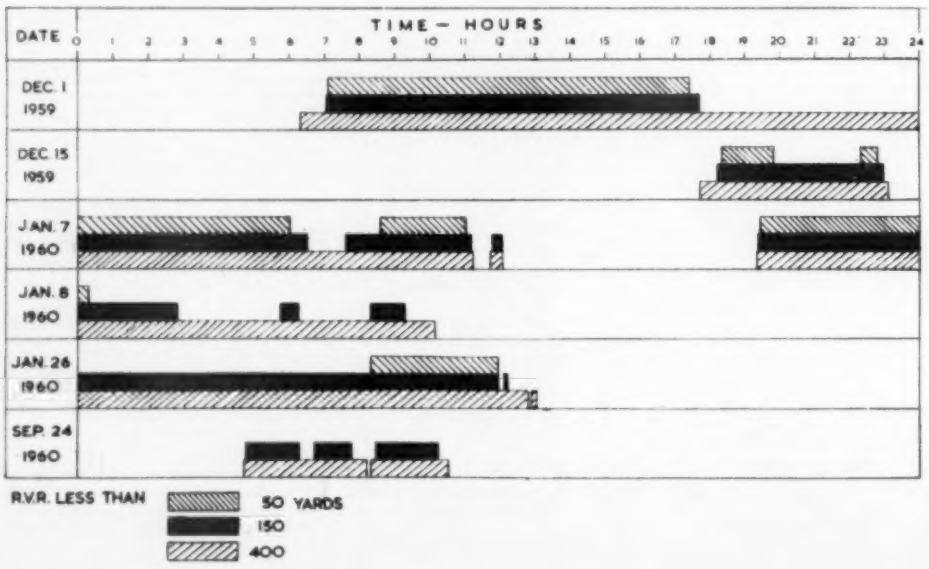
Flight Simulator Training

The second paper was given by MR. D. WILSON, head of the Simulator Division of General Precision Systems. A former member of BALPA but now on the other side of the industry, he spoke on the application of flight simulator training and its increasing use with the coming introduction of blind landing facilities.

After remarking on the first effects following the introduction of automatic approach some years ago—a general lowering of pilot proficiency in instrument approach procedures, which became apparent at the six-monthly instrument rating renewal—Mr. Wilson went on to say that present-day landing weather minima do allow the pilot a decision point at which he can decide between the alternatives of continuing visual or overshooting on instruments.

With the introduction of automatic landing, the pilot will no longer be given a choice. At a point below his previous minima he is going to be in a situation which he would never have been in, had he not had autoland facilities installed in his aircraft. Thus, to provide training facilities duplicating these conditions, it is essential to have a visual flight simulator, as neither the existing flight simulators nor the aircraft can possibly serve as a training medium.

To enable visual simulation to become a reality, the breakthrough came with the introduction of closed-circuit television. Using this system of presentation the prototype G.P.S. visual flight simulator attachment (described in the Jan. 20, 1961, issue of THE AEROPLANE AND ASTRONAUTICS) was produced, and with some minor modifications is the same as the models now in production for the R.A.F. and B.E.A.



Duration of runway visual range below certain limits at London (Heathrow) Airport.

An impressive early demonstration—in September, 1947—of automatic flight was the 2,400-mile Atlantic crossing from Stephensville, Newfoundland, to Brize Norton, Oxfordshire, by a Douglas C-54A of the U.S. Army All Weather Flying Center. From take-off to landing the flying controls, undercarriage and flap gear and throttles remained untouched by the crew members. The lower picture shows the C-54's main automatic control panel.

Copies of Capt. Bressey's paper were distributed prior to the forum and the first member of the electronics industry to reply was MR. R. W. HOWARD of Elliott Brothers (London), Ltd. Before describing his company's automatic system for the VC10 he spoke of the World-wide interest in all-weather landing—that is landing down to zero-zero visibility, and not landing in other extreme weather conditions.

Spurred on by the obvious efforts being made in Great Britain, and the competitive advantages likely to arise if successful all-weather landing systems are introduced, Mr. Howard said that almost every major airline, aircraft manufacturer, licensing and government authority in the World is seriously considering the problem. There are no less than eight all-weather landing programmes actively under way and about 15 major companies have teams of engineers investigating solutions to the problems.

The desire for all-weather operation has increased since the introduction of the large jet transports and even the recent F.A.A. rules for operation to lower minima are not framed in a manner which will allow the many problems to be solved overnight.

Mr. Howard said that he did not know anybody who now believes that all-weather operation is anything but inevitable. The question is not: "shall we develop the required facilities" but rather "how and what shall we develop, and how quickly can it be organized to meet the growing competition from overseas?" It is also feared that systems will be introduced from overseas which will compromise the requirements laid down in this country. It may even happen that systems are introduced which are less scrupulously engineered and less safe than those under development in the U.K.

Speaking on those factors which affect the behaviour of an automatic landing system under operational conditions and in the extent to which it will influence the pilot's responsibility as an aircraft commander, MR. W. H. MCKINLAY, of Smiths Aviation Division, said that it can only carry out the task for which it has been devised. Where the task is difficult and complex the advantage of the automatic solution is that its design involves a detailed study of the task and the problems associated with it. This examination is now proceeding in the case of the SEP.5 autopilot for the Trident.

None of this work alters the fact that the pilot will be the man who decides to use the equipment in a certain set of operational circumstances. Smiths have given particular attention to the provision of displays of monitoring information so that the pilot can check the performance of the system and it is for this reason that they have drawn no distinctions between the autopilot and the displays.

B.E.A. Autoland Programme

The operators' point of view was presented by CAPT. F. ORMONROYD, B.E.A. Flight Technical Superintendent, who said that his Corporation aims to introduce fully automatic landing in the Trident by 1969. This will be a progressive programme and consists of three main stages.

First there will be autoflare, which means that the flare-out at touchdown is automatic but the roll channel is disengaged at a convenient time during the approach and directional control thereafter maintained by the pilot. In this way experience can be obtained of the autolanding technique whilst awaiting the necessary implementation of approved ground aids.

The second stage will be "duplex autoland" and flight director (including Smiths P.V.D.) designed primarily to gain experience of the full autolanding technique in good weather. The use of a duplex system in this way depends on the ability of the pilot to take over control in the event of autopilot failure or for any other reason.

In the final fully automatic landing stage some kind of director will be required to assist the pilot in manually controlling the landing run. The exact nature of this director or the source of guidance had not yet been determined but development work will be undertaken at B.L.E.U. as part of an organized programme dealing with many of the other unknowns—in particular the practical problems associated with possible pilot intervention at a late stage of the landing. A director for the take-off will also be included in the programme.

Turning to the reasons why B.E.A. consider it necessary to take the step of going immediately for what is virtually a blind landing, Capt. Ormonroyd said that from a study of winter low visibility conditions at Heathrow the accompanying table (below) and diagram (opposite page) have been produced.

The table shows the expectation of cancellations, night-stop delays, other delays of more than three hours, and diversions on the Trident operating to runway visual range of 400 yd. at a critical height of 200 ft. The same sort of disruptions are also shown assuming that automatic landing is used down to runway visual range of 50 yd., and that take-off is also possible down to this limit. (A previous study assuming the present take-off minima of 150 yd. revealed that this limit was critical inasmuch as many services which might have taken advantage of the automatic landing facility on a return flight could not take-off in the first place from London Airport.)

General conclusions drawn from the B.E.A. study indicate that cancellations mainly occur on a very few very bad days—days when visibility is so bad that it would still be below the automatic landing and take-off limit. It also appears that on such days the visibility drops from, say, 400 yd. to 50 yd. very rapidly (20-30 min. seems to be normal) and rises only a little less rapidly (say 30-40 min.) so that the "airport closed" period with automatic landing and take-off would be only slightly shorter than "airport closed" period with present methods of landing and take-off. As a result, the alleviation of cancellations is disappointingly small, say 25%.

Night-stop delays also happen mainly on a very few very bad days. The "saving" percentage is only slightly higher than that for cancellations, say 30% of night-stop delays to be expected with present limits. Other delays of more than three hours occur mainly on days when there is possibility of improvement, i.e., when visibility is only just below or fluctuating about present limits. B.E.A. would therefore expect and find, substantial improvement as the limits are lowered for both landing and take-off (say 75%).

LONDON (HEATHROW) AIRPORT

	Cancellations	Nightstop delays	Other delays more than 3 hours	Diversions
Present limits	267	86	171	135
Autoland and T.O.	197	59	45	41
Saved	70	27	126	94
Saved (% of 1968 movements)	.13	.05	.24	.18

26,500 landings + 26,500 take-offs = 53,000 movements.

AMSTERDAM, BRUSSELS, COPENHAGEN, FRANKFURT, PARIS, ZURICH

Present limits	94	5	18	62
Autoland and T.O.	40	3	10	18
Saved	54	2	8	44
Saved (% of 1968 movements)	.19	.01	.03	.15

14,500 landings + 14,500 take-offs = 29,000 movements.

Thoughts to Think On

For the Sixth Henry Royce Memorial Lecture at Derby on Nov. 6 Mr. Peter Masefield gave a forward appraisal of civil aviation. Here are some particularly thought-provoking excerpts on the subject of Air Transport.

AS A RESULT OF THE, SO CALLED, "RATIONALIZATION" OF THE Aircraft Industry, major responsibility for airframes and engines is now concentrated among less than a dozen companies or groups—with the "Big Five" predominant. Whereas this "Sandys-storm" has brought important financial advantages, it has begun to show some weakness in the field of human affairs—especially in the sphere of design. Imaginative young men, who have always been an essential factor in the development of new and advanced products, often do not fit happily into large and impersonal organizations. And, unfortunately, by the nature of things, large organizations tend to become impersonal. In consequence, we may be losing some of the enthusiasms which are so essential to creative work.

CAUSES FOR CONCERN:—

Economics—can the fares be brought within the purse of the "average man" without ruining the airlines?

Safety—can air transport improve its accident record?

Access—can something be done to shorten the journey to airports and the delays when one gets there?

"*Bickerings*"—can a solution be found to the constant internal and international bickerings for a slice of the traffic cake?

THE BIGGEST REQUIREMENT OF ALL IN AIR TRANSPORT IS TO bring down its operating costs. In my view, a cardinal mistake on the part of the World's airlines during the past decade has been too great a preoccupation with increasing speed and too little concern with the fundamental factors of cost.

DEBATE UPON THE SUPERSONIC TRANSPORT, HAS FOR THE MOMENT, become somewhat of an academic bore—although the practical answer to the problems ahead remains as challenging and exciting as ever. The supersonic transport—like the Channel Tunnel—is part of transport's natural evolution and so is certain to come, eventually.

OVER THE NORTH ATLANTIC THIS SUMMER THE BIG JETS HAVE been running at low load factors, in spite of the fact that they have been carrying more passengers, *in toto*, than have crossed the ocean by air in previous years. The trouble is that—although the seat-mile costs of jets are low—their aircraft-mile costs are very high. With only a dozen or so passengers on board, you could hardly throw £5 notes out of the window fast enough to cover the loss—assuming that you had the £5 notes, an open window and that decompression did not convert you into a bung.

MY OWN GUESS IS THAT A MACH 3 TRANSPORT WILL BE DEVELOPED during the next decade and that, in consequence, the slower Mach 2.2 supersonic vehicle will not go into service, except, perhaps, over shorter distances. I believe, also, that the supersonic transport will not be used for distances of less than about 1,000 miles and that, for the longer distances, the "sonic boom" will become tolerated when it becomes an every day affair.

THERE IS NO DOUBT AT ALL THAT THE PRESENT—AND IN MY view, unnecessarily—precarious state of World Air Transport, is, mainly, because of a serious miscalculation in the purchase of equipment. Responsibilty for this must be shared, equally, by airline management, manufacturers' salesmen and governments—all of whom have permitted uneconomical policies to be pursued. It is a striking example of a lack of "Strategic Technical Direction" and a preoccupation with "Tactical Technology." An analysis of what has occurred amounts, simply, to this: a generation of medium-size, propeller-driven, transport aircraft has been cast aside, whilst still in its prime, in favour of a new race of jet-powered aircraft, mostly of a very large size.

BY FAR THE LARGEST ELEMENTS IN ANY AIRLINE'S BILL ARE THE flying costs and standing charges of its aircraft. Compared with these, landing costs and handling fees are very small indeed. To put the major blame for precarious finances upon increased Government airport charges—as I.A.T.A. has done recently—is a smoke screen which should deceive no one.

IT WOULD BE WELL WORTH WHILE TREBLING THE PRIME COST OF an aeroplane if, thereby, the payload could be doubled or the fuel consumption halved. The saving of one pound of weight which can be added to payload—and sold—is worth £210 per annum for a modern long-range transport aeroplane.

A FURTHER, FORESEEABLE, DEVELOPMENT MAY WELL BE THE ballistic transport vehicle which will "lob" its passenger load at block speeds of up to some 10,000 miles per hour over the longer journey distances. Sydney will then become little more than an hour from either London or New York—although the potential economics have still to be worked out.

WHATEVER THE FUTURE FOR THE PASSENGER HELICOPTER (BRIGHT) or the passenger hovercraft (less bright) I believe there is enormous potential awaiting the low-cost fixed-wing aeroplane, capable of a flexible economic performance over distances from 200 miles upwards. There is an enormous market for the "Lofarer."

MODERN TRENDS LEAD US, I BELIEVE, TOWARDS A "MINIMUM-cost maximum-revenue" aeroplane, powered by ducted-fan engines and cruising at around 500 m.p.h. and carrying around 100 passengers. Such an aeroplane, fully developed, might make possible substantially reduced seat-mile costs as well as offering costs per aircraft-mile well below those of present aircraft of comparable size.

Mr. Masefield called for :—

Improved power-plants, to give lesser consumption at lighter weights for both subsonic and supersonic aircraft.

Perfection of automatic take-off and landing equipment, so that regularity of operation can approach 100% at all times.

Wise procurement on the part of the airline managements, on the basis of firm and realistic requirement specifications.

Much better access to airports; largely out of the hands of the airlines.

Much less cumbersome passenger "processing" at airports, very much in the hands of the airlines (except for archaic customs systems).

A clear "two-fare" structure, for speed and economy. This will lead eventually to the supersonic and subsonic service at differential rates.

DOUBLE INDEMNITY.—The two aircraft which are to carry the Skybolt ALBM — Bomber Command's Vulcan B.2 and the B-52H of Strategic Air Command, U.S.A.F. — fly together high above the Mojave Desert near Los Angeles. The Vulcan, crewed by an Avro team, was in the U.S.A. for Skybolt compatability tests.

The Fighting Services

Shackletons to the Caribbean . . .

A QUICK response came from the R.A.F. last week to a request for aid from the hurricane-ravaged Crown colony of British Honduras in Central America. Within six hours of the crews being notified of their task two Shackleton MR.2s of No. 42 Squadron were on their way from St. Mawgan. Another two aircraft left at first light the next day, Nov. 2.

In charge of the detachment was Wg. Cdr. J. R. Ramsden, A.F.C., who is shortly to hand over command of the squadron to Wg. Cdr. H. Mansell. The Atlantic crossing was made via the Azores and Bermuda and the aircraft were based on Kingston, Jamaica, for their casualty evacuation, ferry and general carrying flights.

Besides a seven-man crew each aircraft carried ground crew personnel and necessary maintenance equipment on the flight out.

. . . and Vulcans to the Philippines

THREE Vulcan B.1s of No. 44 Squadron (Wg. Cdr. J. A. G. Jackson) from Waddington, will represent the R.A.F. at this year's Manila Air Show on Nov. 26. The aircraft will fly in from R.A.A.F. Butterworth, Malaya, which they will be visiting on a training exercise.

The R.A.A.F. and the R.N.Z.A.F. are also to be represented at the Manila Show which has now become established as the biggest of its kind in South-east Asia. A total of 11 countries are to take part.

One Thousand Up

ANOTHER Coastal Command unit, No. 22 Squadron (Sqn. Ldr. G. L. Verran), is in the news as having completed, on Nov. 1, its 1,000th operational sortie. This total has been achieved since it became a search and rescue unit equipped with Whirlwind helicopters in 1955. The milestone total includes all flights made in connection with rescue, potential rescue or casualty evacuation duties.

The 1,000th flight was made by a Whirlwind on detachment to Manston which flew a spinal stretcher case with a Nursing Sister from Southend to Stoke Mandeville Hospital, Buckinghamshire. Flt. Lt. P. Burridge, Master Nav. H. Crossman and Master Sig. L. Barnett were the crew involved.

No. 22 Squadron is based at St. Mawgan and has detachments at Tangmere, Chivenor and Valley as well as Manston. Some 200 lives have been saved by the Squadron and, in addition, more than 150 patients have been speeded to hospital, many from ships at sea.

Arrester Gear Developments

MORE R.A.F. airfields in the United Kingdom and Germany are to have runway arrester barriers. Since the introduction of this Swedish-invented device at 2nd T.A.F. airfields in 1958, 18 aircraft—10 Hunters, five Swifts, a Meteor, Vampire and Canberra—have been successfully arrested. In each case the crew escaped injury.

In this country some 50 successful "arrests" have been made to date. All Fighter Command stations have or are to have the barriers as are several airfields in Flying Training Command and one in Bomber Command.

The barrier is intended for use either in the event of an abortive take-off or when on landing there is a danger of the aircraft running off the end of the runway as a result of, for example, brake failure. It consists of a nylon net harnessed to energy absorbing units or braking drums by means of steel cables. When the aircraft hits the net the front fuselage and wings are immediately enveloped and its momentum is checked by the drums via the cables. Damage is negligible and there is no injury to aircrew.

R.A.F. Appointments

THE following are among recent Royal Air Force appointments:—

Air Ministry: Gp. Capt. A. G. Douglas, C.B.E., M.C., A.D.C., to the Department of the Chief of the Air Staff; Wg. Cdr. N. T. Harvey to the Department of the Air Member for Personnel; Wg. Cdr. K. F. Venn to the Department of the Air Member for Supply and Organization.

Coastal Command: Wg. Cdr. H. Mansell to R.A.F. St. Mawgan to command No. 42 Squadron; Wg. Cdr. R. J. Hopkins, D.S.O., to R.A.F. Ballykelly, as Officer in Charge of Administration.

Flying Training Command: Wg. Cdr. J. P. M. Woolley to R.A.F. College, Cranwell, as Senior Equipment Officer.

Technical Training Command: Gp. Capt. L. H. Moulton, D.F.C., to R.A.F. Cosford, to command No. 2 School of Technical Training.

R.A.F. Germany: Wg. Cdr. C. W. Hayes, O.B.E., to R.A.F. Laarbruch as Officer in Charge of Administration.

More Service News

Thames-side Spectacle.—In conjunction with the R.A.F.'s participation in the Lord Mayor's Show on Saturday, Nov. 11, a helicopter flying demonstration is to be staged over the Thames between Waterloo and Blackfriars bridges from 12.30 to 12.55 hrs. Belvedere, Sycamore and Whirlwind aircraft of Nos. 66 and 225 Squadrons, Transport Command, operating from Battersea Heliport and Woolwich, are to use barges moored in the river for the off-loading of troops and equipment. Victoria Embankment will be the best vantage point.

Festival Display.—Main R.A.F. contribution to this year's Festival of Remembrance at the Royal Albert Hall, London, on the evening of Nov. 11 is to be a "Cavalcade of Sport in the Royal Air Force," also the Queen's Colour Squadron from Uxbridge is to give a precision arms drill display. Princess Mary's R.A.F. Nursing Service, the Royal Observer Corps and the Air Training Corps will all be represented.

R.O.C. Opening.—The new headquarters, sited partially below ground, of No. 5 (Watford) Group, Royal Observer Corps, are to be opened by the Mayor of the Borough on Nov. 18.

No. 219 Squadron Reunion.—A reunion dinner for all past members of No. 219 Squadron and its associated serving echelons is being held at the R.A.F. Reserves Club, London, on Saturday, Nov. 25. Dress informal. Tickets, price 30s. each, and other details from Wg. Cdr. D. W. B. Farrar, 3 Beamish Drive, Bushey Heath, Herts.

Aberdeen U.A.S. Dinner.—The annual dinner of the Aberdeen University Air Squadron will be held in the Royal Athenaeum Restaurant, Aberdeen, on Saturday, Dec. 2. All past officers and members interested in attending are asked to contact Flt. Lt. A. D. Meeks, Aberdeen U.A.S., Fairfield House, Whinhill Road, Aberdeen, by Nov. 20.

The "Unconventional" Rocket Engine

A PROGRAMME to investigate new techniques in building large liquid-propellent rocket engines has recently been sponsored by NASA, who have placed separate contracts worth $185,000 with Aerojet-General and the Rocketdyne Division of North American Aviation. The purpose of the two parallel studies is to determine whether there is an "unconventional" engine and vehicle design concept for a rocket stage of 2,000,000 lb. or more that can be developed and produced more economically, at the same time assuring increased reliability. The thrust of the units under consideration is from 2,000,000 lb. to 24,000,000 lb.

Although determining the engine concept is the primary objective, it will be necessary to consider combined engine-vehicle configurations in order to evaluate fully the advantage of various engine schemes.

Propellents are restricted to liquid oxygen/hydrocarbons and liquid oxygen/liquid hydrogen. If a design concept superior to the conventional is found, a second objective of the study will be to establish design criteria and geometry for the engine.

Squirrels and the ICBM

THE suggestion that a squirrel or other rodent nibbling at a cable could send a Minuteman ICBM into the heart of Russia has been strongly denied by Mr. Eugene Zuckert, U.S. Secretary of the Air Force. The opinion that such animals could accidentally touch off a nuclear war is contained in a new book, "The Nation's Safety and Arms Control," copies of which were recently sent to every U.S. Congressman. The author is Mr. Arthur Hadley, grandson of a former president of Yale University. He took part last year in a study conference on arms control at Massachusetts Institute of Technology, sponsored by the U.S. Academy of Arts and Sciences.

Mr. Zuckert explains that there is a complicated system of mechanical and manual controls to prevent accidental launching of a Minuteman. Cables used to relay coded communications are buried deep in the ground and an animal gnawing at a cable will set off an automatic alarm causing the system to "fail-safe."

Taking up another statement in the book to the effect that Matador missiles, which can carry a nuclear warhead, are standing unprotected in Europe and can be fired by one man who sleeps beside them, Mr. Zuckert says that safety controls make it impossible for one man to fire such a missile intentionally or in error.

The book also describes an incident in which it claims that two Bomarc suface-to-air missiles automatically elevated themselves on their launch pads and were showing exhaust fumes before Air Force officers rushed out from a mess hall and pulled wires and threw switches to prevent a launching. The only case resembling an incident of this kind, Mr. Zuckert points out, took place about a year ago at a U.S. base when two Bomarcs elevated themselves due to a short circuit. However, there was at no time danger of an accidental launching and smoke did not come from the exhausts.

NASA Studies Orbital Refuelling

URGENT studies are going on at the Marshall Space Flight Center in Huntsville to see if the U.S. Man-on-the-Moon project can be speeded up by the development of techniques to refuel spacecraft in close-orbit around the Earth. The alternative is to press ahead, as soon as possible, with the huge Nova vehicle to perform the two-way mission in one shot.

If valuable time is not to be lost, U.S. authorities consider that NASA must come to a decision before Christmas. Dr. Wernher von Braun has summarized the position. It will take a payload of about 400,000 lb. for a soft manned-landing on the Moon and for the return trip. He said this payload requirement could be achieved in one of three ways:—

(1) Make four flights to rendezvous with a Saturn C-3. This vehicle will have two 1.5m. lb. s.t. Rocketdyne F-1 engines in the first stage and J-2 200,000-lb. thrust lox-hydrogen engines in the upper stages. The C-3 will be capable of placing 100,000 lb. in an Earth-orbit per mission.

(2) Make two flights to rendezvous with a Saturn C-4. This vehicle might have four 1.5m. lb. s.t. F-1 engines in the first stage and J-2 engines in upper stages. It would be capable of lifting 200,000 lb. into orbit per mission.

(3) Go directly to the Moon with the huge Nova vehicle capable of carrying the whole 400,000 lb. from lift-off to lunar landing.

Dr. von Braun pointed out that it would be necessary, in any case, to build vehicles in the C-3 and C-4 class. "If we go to the C-3, we might keep Nova as a back-up. If we go to the C-4, we might cancel Nova." The advantages and disadvantages of rendezvous against direct flight operations were summed up as follows: With the C-3, we may be ready perhaps one-and-a-half years sooner but the lunar mission would require four completely successful launchings. With the C-4, development would take longer, but would involve fewer launchings. Nova probably would be more expensive, but on the other hand might involve less chance of failure. It would, however, take longest of all to bring to fruition.

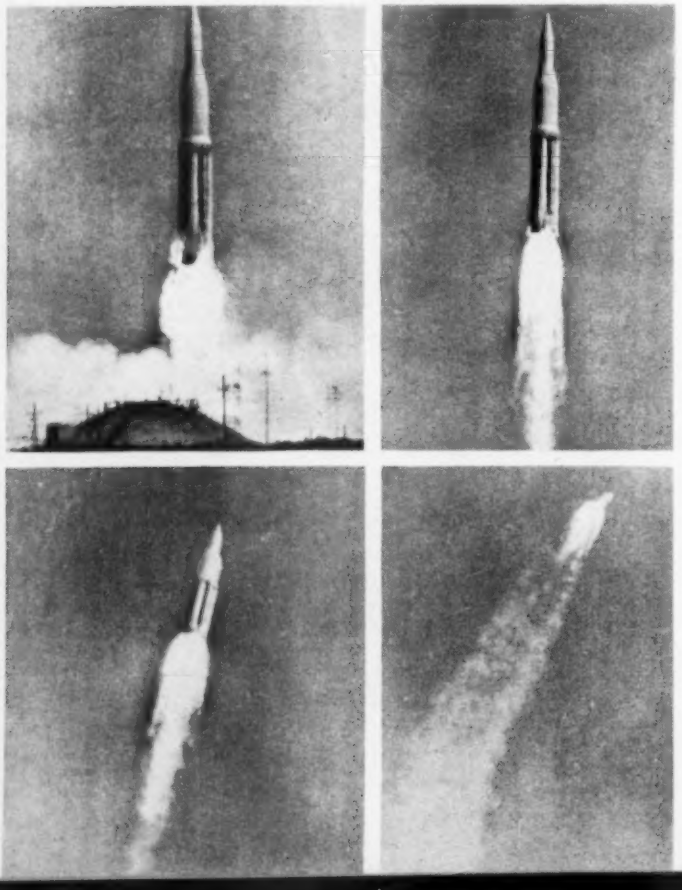
It has recently been disclosed that $8 million has been budgeted for rendezvous experiments in fiscal year 1962.

Materials for Spaceflight

A ONE-DAY symposium on "Materials in Space Technology" has been arranged by the British Interplanetary Society for November 22. The meeting, which has particular importance in view of the forthcoming developments in European space-collaboration, covers a wide field of materials interest. The papers are as follows:—

"A General Survey of the Materials Problem," by Prof. A. J. Murphy (College of Aeronautics); "Polymers in Space," by A. L. Soden (Rubber and Plastics Research Association of Gt. Britain) and Dr. N. H. Langton (National College of Rubber Technology); "Magnesium in Spaceflight," by Dr. C. J. Smithells (Magnesium Elektron, Ltd.); "Aluminium and its Alloys," by Dr. E. G. West (Technical Director, The Aluminium Development Association); "High Strength Steels," by F. J. Wilkinson (Bristol-Aerojet, Ltd.); "The Development of Nozzle Materials," by Dr. D. Bunting (M.o.A., R.P.E.); "The Use of Graphite Materials in Aerospace Technology," by R. K. Hurden (Morganite Exports, Ltd.) and A. E. White (Morganite Research and Development, Ltd.); and "The Effect of the Radiations Encountered by Materials in Space," by Dr. R. S. Barnes (U.K. Atomic Energy Authority).

The symposium is being held in the Lecture Theatre of the Royal Aeronautical Society, 4 Hamilton Place, London, W.1. Registration forms can be obtained from Mr. L. J. Carter, Secretary, British Interplanetary Society, 12 Bessborough Gardens, London, S.W.1.



These pictures provide a graphic impression of the launching of the prototype Saturn C-1 booster at Cape Canaveral on October 27. The 8-min. test mission took the vehicle to a height of about 95 miles and some 220 miles downrange.

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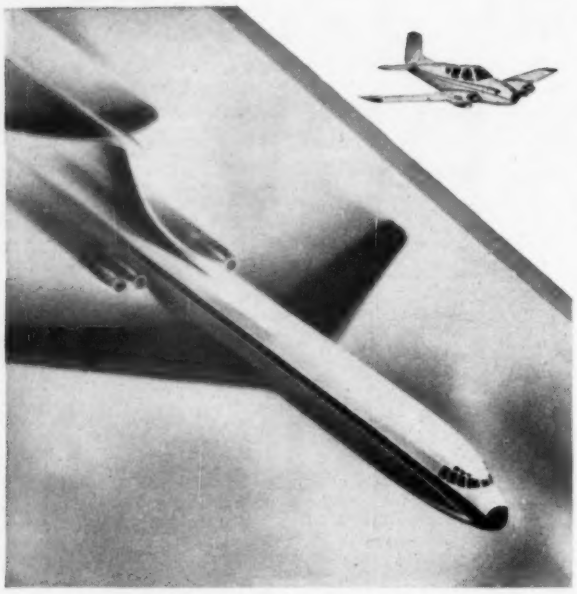

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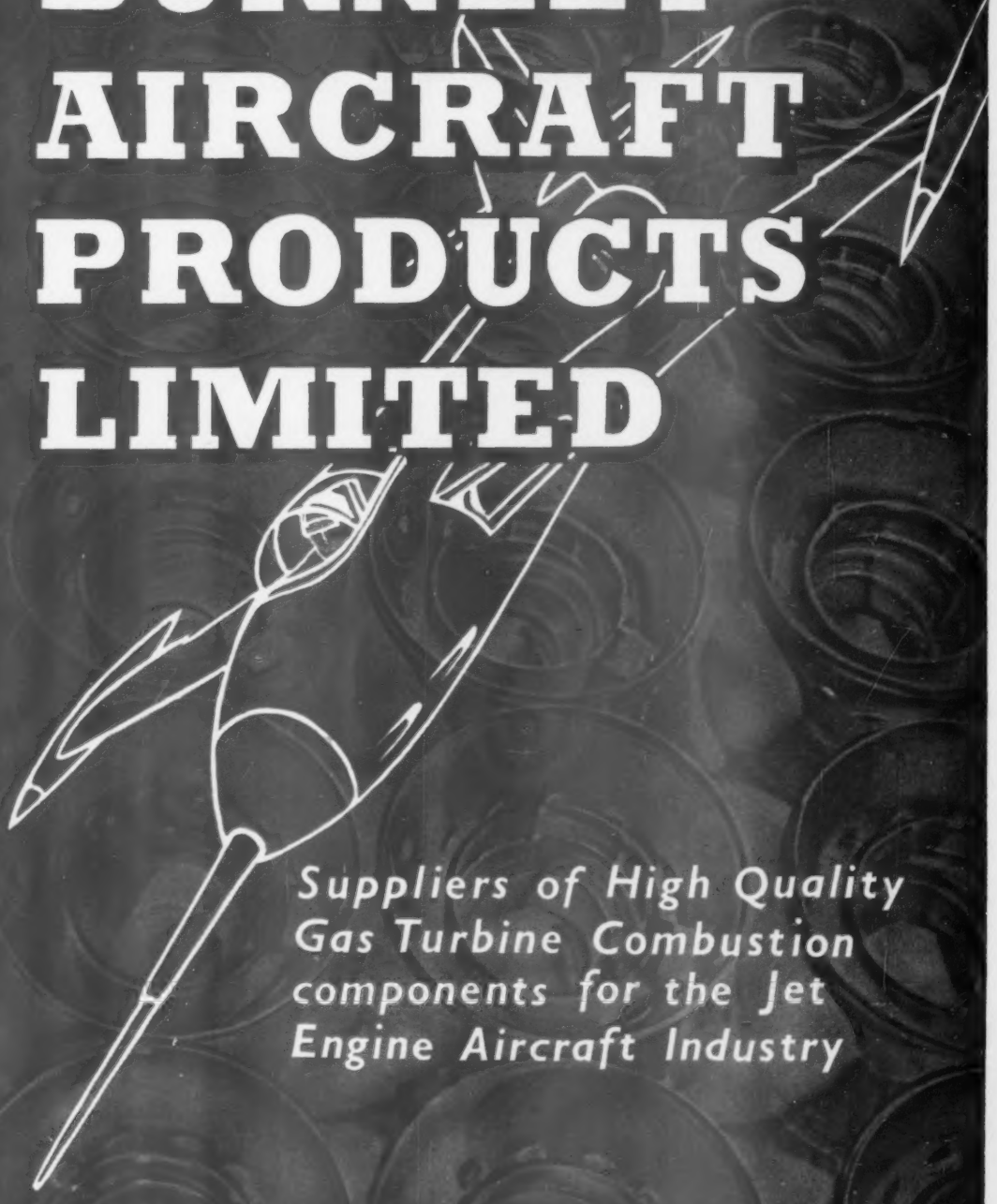

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Operating Nike-Zeus

Once again the anti-missile missile is in the news. This article by KENNETH GATLAND *gives the latest information on the U.S. Army's projected counter-weapon.*

A STATEMENT by Marshal Malinovsky, the Soviet Defence Minister, during the recent Communist Party Congress that Russia had solved the problem of destroying missiles in flight has been the subject of much discussion, especially in the United States where the Nike-Zeus anti-missile missile is still undergoing preliminary testing. Most observers are inclined to the view that the Soviet Armed Forces may have established the theoretical capability of destroying ICBM re-entry heads—as the Americans themselves have done—but that they are still some way from deploying operational counter-weapons.

A Nike-Zeus development round ready to fire from an underground launch pit at White Sands, New Mexico.

In any case, there can be no question of these missiles being used for the wholesale defence of cities. The task is far too great for that. The best that is being hoped of Nike-Zeus is that it may serve to gain time for effective retaliation in the event of nuclear war, mainly by the protection of the major ICBM sites and SAC airfields.

The suggestion from some quarters that Marshal Malinovsky's statement is bound up with the testing of the 50-megaton bomb in Novaya Zemlya—in fact that this might be the warhead for a defensive missile—seems very wide of the mark. At least, it would appear to be an extremely wasteful method of dealing with the problem and one that could be quickly neutralized by the ripple-launching of ballistic missiles and use of decoys. The anti-missile missile, above all, demands accurate target discrimination and precise guidance; given these attributes a comparatively low-yield nuclear explosive should be sufficient for the job. The other criterion, of course, is that the missiles should be available in large numbers at strategic points in order to deal effectively with large-scale missile attack.

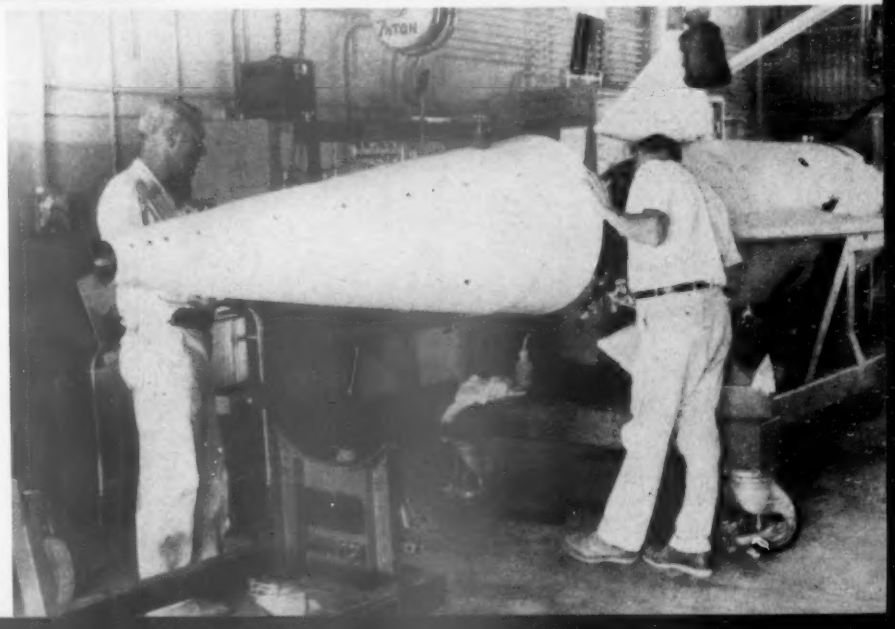
A survey of the problem of the anti-missile missile was given in an article by Mr. G. P. Coates in THE AEROPLANE AND ASTRONAUTICS on Oct. 12, 1961. We are now in a position to give some further details of the Nike-Zeus weapon system.

Command Guidance

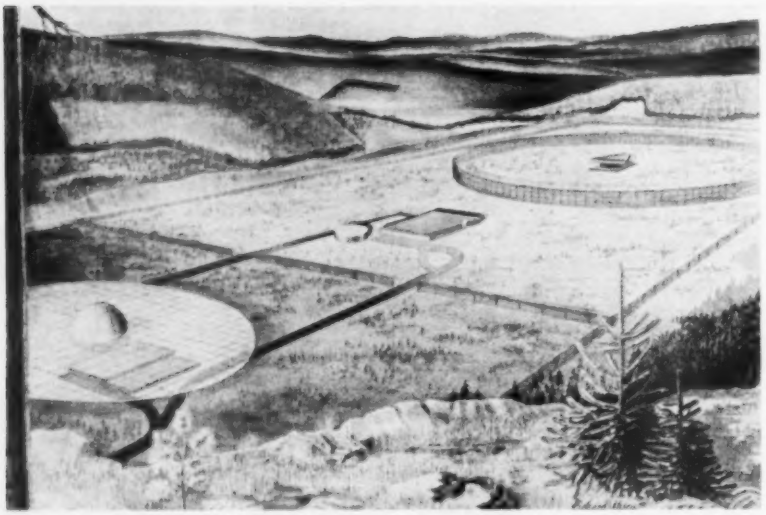
Designed for active defence against ICBMs, IRBMs and glide-type missiles, Nike-Zeus is at present the only anti-ICBM system under advanced development in the United States. The history of the project goes back six years when initial studies began at Bell Telephone Laboratories. Full-scale development was eventually authorized in 1957—the year that Russia first tested her ICBM and launched Sputnik I—and preliminary design of the major units was completed in 1958. A year later the first R. and D. missile was fired at White Sands, New Mexico, and this year preliminary testing of the Nike-Zeus system's tarket track radar started at Ascension Island on the Atlantic Missile Range.

On Sept. 9, 1961, the first full-scale testing of "missile, guidance and related systems" began at Pt. Mugu, Calif. These are expected to lead early in 1962 to the first test engagements between ICBMs launched from Vandenberg A.F.B. and Nike-Zeus missiles sent up to meet them from Kwajelein Atoll some 4,500 miles away in the Pacific.

The Zeus system employs command guidance and operates in conjunction with highly sophisticated acquisition, target-track, discrimination and missile-track radars. For data processing, there are three high-speed digital computers of large



Technicians at the White Sands Missile Range, New Mexico, join the steerable nose-cone to the Nike-Zeus afterbody. Each section of the anti-missile missile is handled separately and joined just before firing.



An artist's impression of a Nike-Zeus Defense Center equipped for the early detection of oncoming ICBMs. At left is the Acquisition Radar receiver and, right, the transmitter with triangular array antennae and radar beam-forming "fence"

memory capacity. An artist's impression of a Nike-Zeus Defense Center is shown in the accompanying illustration. Among the latest solid-state devices used are MASERS, MAVARS, VARACTORS and mesa transistors. Twister memory units and deposited-carbon resistors are some of the specially developed components. All are designed to be manufactured to extremely high standards of reliability.

The Zeus Acquisition Radar (ZAR) is a high-power unit for long-range detection with separate transmitter and receiver. The transmitter has a triangular array of antennæ, each 80 ft. long, with a circular radar beam-forming "fence" around it. The receiver is effectively a very large Luneberg lens with receiver horns which rotate synchronously with the transmitter antennæ. This part of the installation will provide target information on a large number of missile targets simultaneously.

Nike-Zeus emerges from the smoke of its own exhaust in a recent test firing. The all-solid, three-stage, missile has an initial thrust of more than 450,000 lb.

The Discrimination Radar (DR) employs radar principles in its transmitter to obtain identification of approaching targets.

Once the target is located by the ZAR, the Target Track Radar takes over automatically. It furnishes continuous, precise trajectory information to the computers to determine the interception point. Part of its equipment is a huge 25-ft. Cassegranian reflector in a 40-ft. radome.

Finally, the Missile-Track Radar tracks and guides the Zeus missile to interception point and commands its detonation.

Missile Performance

The missile itself must be capable of 360° operation. It must be able to manœuvre outside as well as within the atmosphere in order to destroy targets at a safe distance from the defended territory. The operational missile will have three stages and an overall length of 48.3 ft. More than 450,000 lb. of thrust is developed by the first stage. Stage two is stated to be particularly advanced, with a high-performance solid propellent, while the third stage motor has been specially designed to manœuvre the nuclear warhead in response to steering commands from the ground.

Nike-Zeus throughout has been a project of the U.S. Army under the ægis of the Army Rocket and Guided Missile Agency at Redstone Arsenal, Huntsville, Alabama. Prime contractor is the Western Electric Company, with Bell Telephone Laboratories responsible for systems research and design. Among the 18 major sub-contractors is Douglas Aircraft which is concerned with the overall missile and its handling and test equipment. The first stage booster has been developed by the Thiokol Chemical Corporation. Grand Central Rocket Co. are supplying the second-stage sustainer and "jet-head" motors.

Scout Test for Ion-Drive

THE project to test the first ion-drive engine prototypes in space is expected to take place within the next few months. Basis of the programme is the SERT 1 (Space Electric Rocket Test) capsule built by the Radio Corporation of America for NASA's George C. Marshall Space Flight Center. It will be used to demonstrate the feasibility of producing thrust with ion engines as well as to verify the predicted thrust level and engine operating characteristics, particularly neutralization of the ion-beam, as measured in ground vacuum facilities.

SERT will carry two low-thrust electric propulsion units on each flight in pods (see picture Nov. 2, p. 579). One will be a unit developed by Hughes Aircraft Corporation in conjunction with the Lewis Research Center, and the other a unit developed by Electro-Optical and Plasmadyne.

The SERT packages will have a diameter of 30 in. and weigh approximately 200 lb.—varying slightly because of differences in weights of the test engines. It is proposed to launch the engine capsule in a Scout rocket on a ballistic trajectory with the engine pods folded up over the payload. After separation from the carrier rocket, the first electric engine will be fired in an attempt to "de-spin" SERT and then the other package will be started to try to spin it up again.

The test vehicle is expected to have a peak altitude of 4,000 miles and a maximum range from Wallops Island of about the same distance. The time available for test will be a maximum of one hour.

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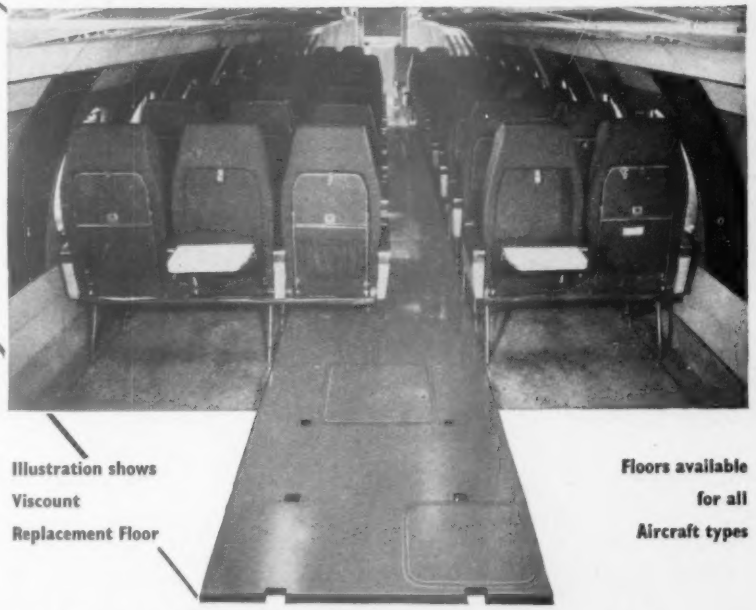

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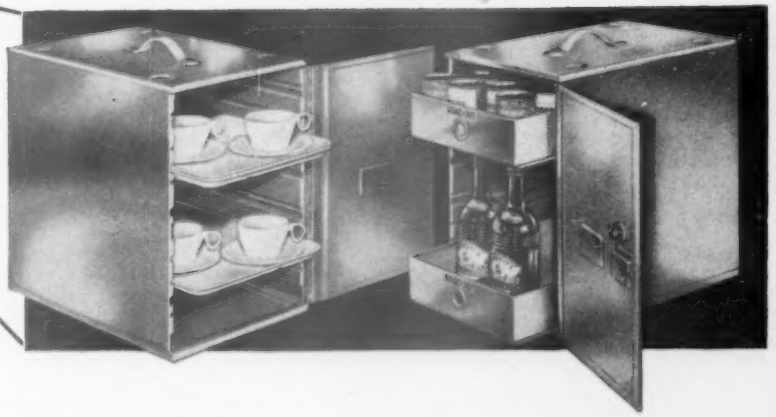

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Personal Flying

FOR its 1962 Comanche 250, Piper has introduced a number of refinements to improve comfort and performance. One of the most significant changes is the replacement of manually operated flaps by electric actuation, and redesign of the flaps themselves to add to their efficacy. The new Max-Lift flaps are of the slotted type, and extend outwards and downwards to a maximum angle of 32 degrees.

Landing speed is thus reduced to 61 m.p.h., and the take-off and landing distances reduced by 20 and 15%, respectively. The latest Comanche is also powered by a new version of the 250 b.h.p. Lycoming engine, the O-540-A1A5, which incorporates extensive nitriding for extra hardening and longer wear, new "choked" cylinders, new pistons with four-ring design and other features to maintain high compression and lower oil consumption. The O-540 is also available with fuel injection for the first time, offering more precise mixture adjustment, exact fuel consumption indication and freedom from carburetter icing.

Many improvements in cabin furnishing have been made, and a de luxe or "Palm Beach" interior including leather seat upholstery has been made available. Optional fuel capacity, with auxiliary tanks, of 75 Imp. gal. is another feature of the new Comanche, which at 75% power can cruise at 181 m.p.h. for over 1,000 miles. In all, four versions of the Comanche 250 are available, the standard aircraft costing $21,990 f.a.f.

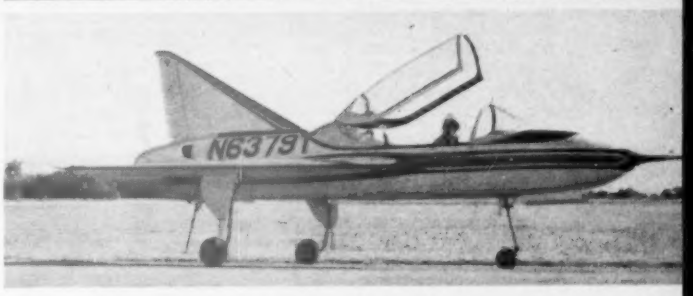
The 1962 Piper Apache, or Model H, also has several improvements. Its 160 b.h.p. Lycoming O-320 engines incorporate several of the modifications of the larger Lycoming in the Comanche, and provision has been made for the factory installation of more comprehensive electronic navigation and communications equipment, including DME. The Apache H can cruise at 171 m.p.h. over a non-stop range of 1,250 miles.

• • •

A startling new "home-built" design has recently been completed by a member of the U.S. Experimental Aircraft Association Herbert Dean, of Flint, Mich. Designated the Delt-Air 250, it closely resembles a scaled-down Convair delta-wing fighter, and seats two occupants in tandem. A scale model has been tested in the wind-tunnel of the University of Michigan, and the Delt-Air is estimated to have a maximum speed of 240 m.p.h.

Of all-metal construction, the prototype was built in the basement of its designer's home in two and a half years of spare time, and has been undergoing taxi tests at Flint Airport prior to its first flight. Power is provided by a 180 b.h.p. Lycoming engine mounted in a pusher installation in the rear fuselage and driving a 72-in. diameter Hartzell propeller.

The clamshell-type canopy is electrically-actuated, and the cockpits are fitted with dual control. The nosewheel undercarriage, which has extraordinarily unsubstantial-looking legs, and the rear tail bumper, all retract flush into the wings and fuselage and all openings are covered by glass-fibre doors. The tail bumper is presumably intended to prevent the airscrew from contacting the ground, but it would not seem to allow a great deal of fuselage rotation for take-off and landing.



DIMINUTIVE DELTA.—One of the most ambitious amateur-designed and constructed aircraft yet seen, the two-seat Dean Delt-Air 250 is due to make its first flight in the near future. Powerplant is a 180 b.h.p. Lycoming.

Wing area is only 97 sq. ft., and the section is a thin NACA 63-206 modified. Empty weight is 925 lb. and gross, 1,460, giving a wing loading of 15 lb./sq. ft. Cruising speed is estimated at 218 m.p.h., and initial climb, 2,300 ft./min. Landing speed is estimated at 72 m.p.h.

• • •

To mark the 50th anniversary of design advancement by its founder, Clyde Cessna, the Cessna Aircraft Company has launched an extensively modified range of its personal and executive aircraft for 1962, which is foreseen as the best marketing year in the industry's history and a record year for the company. Among the three light twins, nine single-engined aircraft, a helicopter and a new autopilot in Cessna's "Anniversary Fleet" for 1962 will be the unconventional Skymaster push-pull twin-boom twin-engined four-seater, which is to be certificated in the next few months and "is expected to dominate its area of the twin-engine market" on its introduction next summer.

Apart from the usual changes in paint schemes and furnishings, a number of modifications have been introduced in Cessna's "mighty middle line" of single-engine types, with certification for up to six occupants for the Skylark, 172 and the Skyhawk and Cessna 180, and up to four for the basically two-seat Model 150. No significant change in payload is involved in most cases—provision being made for installation

LUXURY LIGHT-PLANES.—Above, extensively modified, the 1962 Cessna Model 210, has rear windows in the cut-down fuselage for 360-degree visibility. Right, six-seat capability, a new fuselage with rear window installation, a bigger cabin and many other modifications have been incorporated in the 1962 Cessna 182 and Skylane.

of twin seats in the baggage compartment of the models concerned, for the carriage of children up to the corresponding baggage weight.

In the case of the Model 182 and Skylane, the fuselage has been extensively modified to allow the incorporation of rear-vision windows behind the wing, to afford 360-deg. pilot visibility. The cabins of these models have also been enlarged, and the aileron cables re-routed for smoother control, while the former adjustable tailplane has been replaced by a fixed type with elevator tabs. For the first time, the big slotted flaps of the 182 series are electrically, instead of manually, operated.

Most of these modifications have been incorporated in the latest Model 210 which, however, has an hydraulically operated flap system. Other changes made in the Cessna range include redesigned and more efficient wing-tip and undercarriage fairings, and the provision of a constant-speed airscrew on the Model 175 as standard. Mainwheel legs in the Model 150 have been moved two inches aft, for improved ground handling. All the Cessna single-engine range are capable of being equipped with the new Nav-O-Matic single-axis transistorized autopilot, which is being marketed in the U.S. for $995.

• • •

Progress continues with the gyroplane of Avian Aircraft, Ltd., which is undergoing flight trials at Waterloo-Wellington Airport, near Kitchener, Ont. Since March this year, the Avian 2/180 has made about 200 flights, and the programme will continue throughout the winter for certification later in 1962.

The early part of the flight-test programme was undertaken in the immediate vicinity of the runway, but the Avian has since flown farther afield. Assembly-line production is planned as soon after certification as possible, but a limited number of preproduction aircraft will be built for demonstration and promotional purposes. Planned production price is $15,000, with a slightly higher figure for the demonstration aircraft.

• • •

The On Mark Engineering Company of Van Nuys, California, has sold a fully pressurized Marksman executive aircraft to the South African Iron and Steel Industrial Corporation, Ltd., of Johannesburg. Converted from a military Douglas B-26, the Marksman cost more than $500,000, and incorporated a custom-styled and pressurized interior; complete radio, radar and electronic equipment; the latest navigational aids; and a comprehensive spares backing.

In addition to that order, five more Marksman aircraft have been sold in the U.S. during 1961. All were of the latest type, with an improved eight-seat cabin having 6 ft. 1 in. headroom. Two have been delivered and three are in production for delivery later this year. The South African aircraft will be ferried to Johannesburg early in 1962.

TUBULAR TAIL.—Despite its unconventional appearance the Avian 2/180 gyroplane has smooth contoured lines overall.

Gliding Notes

by Dr. A. E. Slater

WG. CDR. J. CROSHAW reached 31,700 ft. at Zell am See in Austria on Oct. 28, and it is reported that this was a "local record." He had already reached 21,000 ft. in a previous attempt when his oxygen supply failed. Croshaw was in the winning team (R.A.F.) at this year's Inter-Services team championships.

Zell am See gliding centre is near a lake in a low pass just north of the Salzach valley which runs from W. to E. The Grossglockner, 12,457 ft., is 15 miles to the S.S.W., and presumably it started up a wave in which Croshaw climbed, as the forecast chart showed a S.S.W. wind ("actual" charts are held up by the Forecasting Office's move from Dunstable to Bracknell).

One is reminded of an earlier occasion when a local height record was set up abroad by a British visitor; Eric Collins, the first British Silver "C" pilot, did so in 1934 when he visited Hornberg, the World's first high-performance gliding school, soon after it had been founded by Wolf Hirth.

• • •

ANNUAL DINNERS of the following gliding clubs have been fixed: Cambridge University G.C. at Emmanuel College on Nov. 18; Derbyshire and Lancashire G.C. at St. Ann's Hotel, Buxton, on Dec. 1; London G.C. on Feb. 16, and before that the club's Christmas dinner and dance, to be held on Dec. 16.

The British Gliding Association has fixed its annual general meeting for Mar. 10, 1962, and the Annual Ball for the previous night.

The Association has a new secretary, Miss Frances Leighton. She takes over on Nov. 13 from Anthea Russell, who has been at the job for two years.

For next year's National Championships, which again are unlikely to have room for all who want to enter, the B.G.A. Flying Committee has drawn up a provisional list of 144 names in order of priority from which the entrants will be selected. It is based, in a manner too complicated to describe in a few words, on their performance in previous B.G.A. approved competitions, which cannot have been too easy, as so many of this year's regional competitions were frustrated by bad weather. The list is headed by John Williamson, George Burton, Philip Wills, Peter Scott, Tony Deane-Drummond, Derek Piggott, Geoffrey Stephenson, A. J. "Rocky" Stone, Anne Burns, and David Ince, in that order.

• • •

OCTOBER 24 was the 50th anniversary of the first prolonged soaring flight, if you define that term as a flight exceeding the five minutes required for a "C" soaring certificate. On Oct. 24, 1911, Orville Wright made soaring flights of 5 min. 20 sec., 7 min. 30 sec. and 9 min. 45 sec., at Kill Devil Hill. It is not generally known that Alec Ogilvie, from England, had been with him there since Oct. 10 and made several soaring flights himself, including one of 59 sec. on Oct. 25 and 1 min. 5 sec. on Oct. 26.

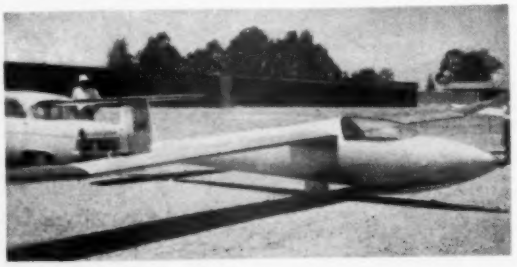
Col. Ogilvie, when I called on him in the New Forest a few years ago, explained that the sand dune over which they soared was crescent-shaped, not a ridge, and it was necessary to hover accurately over one point to avoid being blown away sideways.

• • •

SOUTH AFRICA'S national championships are to be held at Kimberley aerodrome from Dec. 28, 1961, to Jan. 7, 1962. Whether Philip Wills will have left by then is uncertain, but Peter Scott is expected there in January.

• • •

E. "BOET" DOMMISSE reports that Pat Beatty has raised the South African 100-km. triangle record to 104.8 km.p.h. (65.1 m.p.h.) in his highly refined BJ-2, of his own design. Also that he tows it across the field backwards by means of a ball-and-socket joint—socket on the tail and ball on the car bumper.



The BJ-2, designed and built by Pat Beatty in South Africa, being towed tail first.

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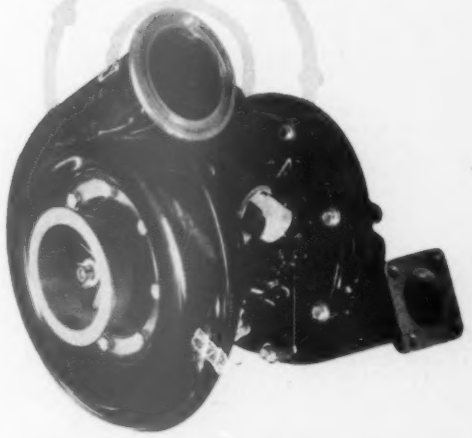

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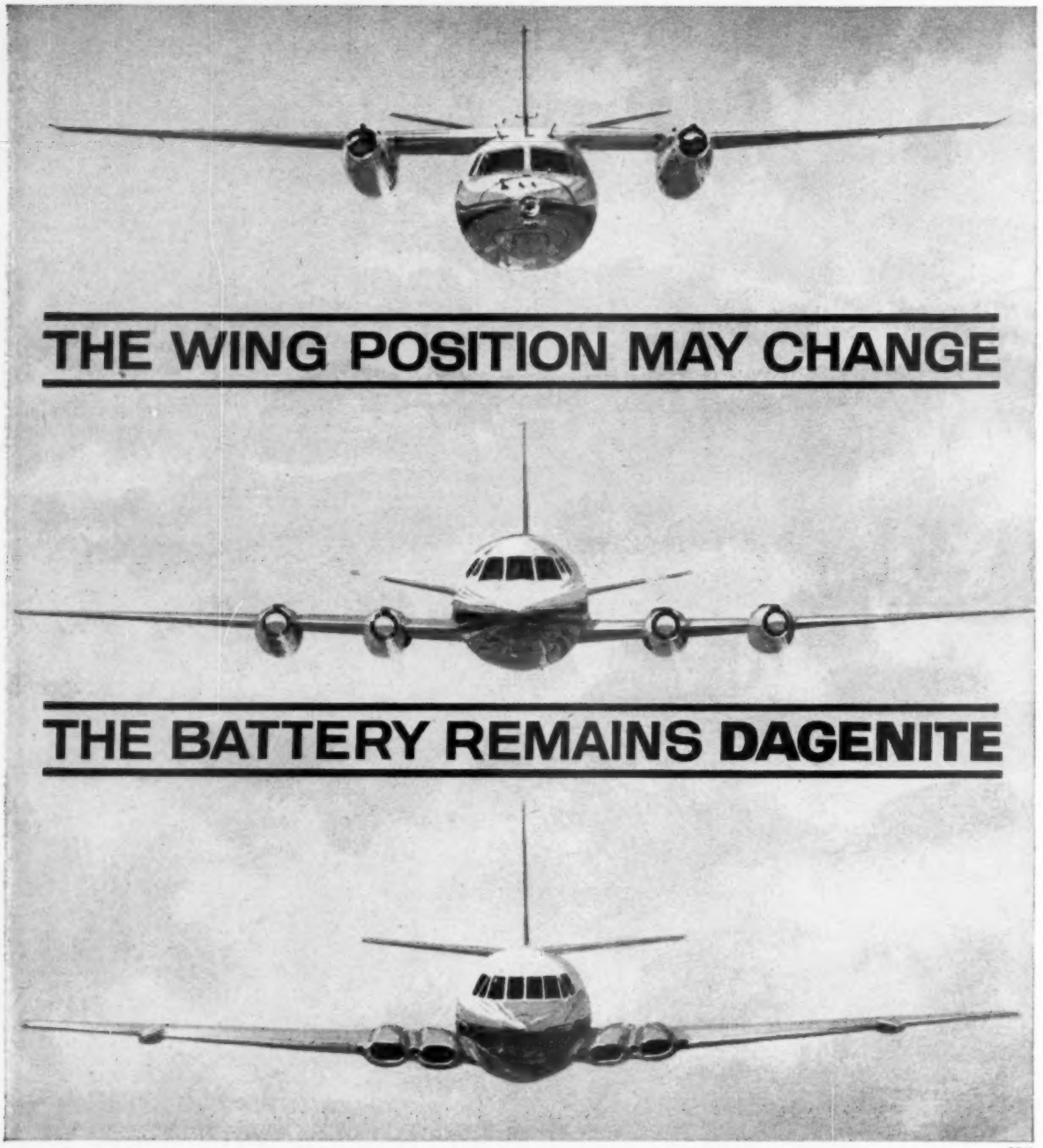

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Correspondence

Fifty Years of the Aero Engine

IN your issue for Oct. 12, M. Keuleyan commendably seeks justice for pioneers, but he goes a little too far in stating that the late George Jendrassik designed and built a gas turbine as early as 1913 (when he was 14 years of age!). At the time of his untimely death, at the age of 55 in 1954, the distinguished ex-Hungarian engineer was assisting my company in its development of the Pressure Exchanger and we were able to supply details of his achievements to your associated journal, *The Oil Engine and Gas Turbine*.

If your correspondent will consult the March, 1954, issue, he will see that Jendrassik's first gas turbine, with 10-stage axial compressor, first ran in 1937—the year in which Whittle's WU also ran for the first time. A little-known fact, likewise disclosed, was the bench-testing by Jendrassik of a turbo-prop engine in 1941; this engine, with 15-stage axial compressor, was in many ways of advanced design, but it was a victim of events and was never developed.

London, W.1. T. G. HICKS,
Managing Director,
Power Jets (Research and Development), Ltd.

Precautions against Radioactivity

IT is encouraging to know that the armed forces are as alive to the problems we shall face in the nuclear-bomb age as they were in the 'thirties to the problems of the then coming World War.

In your article "Fall-out Contamination and Aircraft" on Oct. 26, we were reassured to read that "a good hosing down" would remove all radioactive traces from the outside of any aircraft and, with it, all danger to maintenance men who might later work on it. Then on Oct. 30, following the 30- and 50-megaton explosions, B.B.C. TV News was able to show us an eager aircraftman lifting from beneath the wings of a meteorological aircraft the first precious plates which would tell us whether the aircraft was dangerously contaminated.

Darkness alone, no doubt, prevented us from seeing the battery of hoses "at the ready" and the aircraftman raised the plates to the cameras *with his bare hands*. But apart from that the whole scene and your article were an immense comfort to us all.

Croydon. RICHARD ROWE.

[In the case of the R.A.F. Met.-flight aircraft there were, apparently, no hoses lurking in the background. The Air Ministry tell us that "no special handling precautions were taken because of the low level of concentration encountered." Their spokesman would give no clue as to how this was determined prior to examination of the filter containers.—ED]

No Overshoot at Dublin

WE wish to refer to the article published under the title "OPtional Reading—16" in THE AEROPLANE for Oct. 19 last. The article opens with the sentence "With two overshoots at Dublin, one at Boston, and one at Idlewild since I began to discuss the landing case three issues ago." By the phrase "three issues ago" we assume a date towards the end of September, 1961.

We are at a loss to understand the reference to Dublin because if by overshoot C.C.J. means running off the end of the runway, we can assure you no such occurrence has happened at Dublin for many years; alternatively, if the author is referring to the opening up of power on approach and going round, no such incident occurred at Dublin during the period under review.

Dublin. W. P. DELAMER,
Airport Manager.

Rationalizing Liabilities

I WAS interested to read Dr. Konorski's article "Rationalizing the Carrier's Liabilities" (Sept. 21 last). There are certain observations which might usefully be made.

It is now six years since the 1955 Protocol and less than 25 ratifications out of the necessary 30 have been deposited. It therefore seems rather optimistic to announce that the Order in Council "will probably be published shortly."

The documentary simplifications for Convention purposes will not save any work for the air carrier. Passenger tickets and air waybills will still be necessary in great detail *for practical reasons*. All that the Protocol achieves is a reduction in the number of *legal* requirements. In my view it does not even go far enough in that direction.

The deletion of the defence of negligent pilotage for baggage and cargo has little to do with the "higher performance standards expected nowadays from the air carriers." This defence was inserted in 1929 in imitation of Maritime codes. It is incompatible with the other defences in the Convention and has been of no practical and little theoretical value.

The Charterer of an aircraft does not determine the fare, nor, unless he is to operate the aircraft himself, does he have commercial or operational control. Responsibility for issuing carriage documents varies from one charter party to another.

The problem of air charter under the Warsaw Convention is not the fear that a litigant may sue a worthless travel agent. It is the difficulty of determining who is protected by the Convention limits—the performing carrier or the contracting carrier?

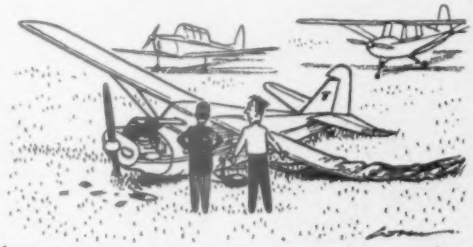
May I say that I greatly enjoyed this timely article and hope that the author may appreciate that my remarks are made in a friendly spirit.

London, E.C.3. HAROLD CAPLAN.

Groundabout

The More the Less. I wonder if you, like me, have been deeply touched and even mildly worried by the North Atlantic airlines' heartbreaking reports of the shocking bad business they've been doing this year? One pictured great echoing cabins with the solitary passenger being told "Take a seat—any seat" by a cabin staff who talked sombrely among themselves, perhaps recalling the story about the captain of such a craft who broadcast after take-off: "Good morning, sir—I hope you're hungry—we've got 133 breakfasts and lunches on board." Nobody, it seemed, wanted to cross the Atlantic. But suddenly—surprise! IATA announce that 1,484,674 people flew the route in 1961's first nine months, 7.8% *up* on 1960. Air cargo increased 42.9%, mail by 14.6%. So really I don't know what the airlines are glooming about. Unless it's the passenger load factor of 52.6% and even that's dropped by only 16.1%. If *that's* what's troubling them, let them halve their fares and double their load factor, thus maintaining their revenue. Next question, please.

*



"At first it was just a puncture—then I kicked it..."

*

Machsimum Requirement

A scientist living at Staines
Is searching with infinite pains
For a new type of sound
Which he hopes, when it's found
Will travel much faster than planes.

—From B.E.A.'s "Intercom."

*

Chopper Dept. On my way home after flying from Battersea Heliport in a Wrent—er, sorry—Rent-a-Copters Hiller, I saw one of the Milk Board's "Drinka Pinta Milka Day" posters. The new company might adopt the idea to their own ends, like: "RENTA COPTA FLIGHTA DAY." Or they might, of course, not. Their managing director, Ken Riddy, previously spent three years operating choppers for a whaling company. On the last of their expeditions, a whaling ship *without* helicopters was more successful than the one which used them. Ken figured that whales can now spot a 'copter a mile off and take evasive action.

by Gordon

Industry Record

Cossor's Future

Plans for the expansion of A. C. Cossor, Ltd., and strengthening of its marketing potential have been announced by Mr. C. F. Adams, chairman of the Raytheon Co., the American company which acquired Cossor in September. He has said that during the next few months a careful analysis will be made of Cossor's products and markets in order to take the fullest advantage of complementary Raytheon products that can be offered through the existing Cossor channels of distribution. Likewise Cossor products will also be reviewed for export through Raytheon distribution channels.

Raytheon are devoted exclusively to electronics and have made a speciality of the design and manufacture of radar, sonar, missile and communication systems. The company is backed additionally by subsidiaries and affiliates in Europe. As is well known Cossor, too—through the largest of its divisions—is intimately concerned with secondary and weather radar and it is in this field that the two companies' products are largely complementary.

In the communications realm the British company's sale of VHF, UHF and mobile two-way radio systems have more than doubled in each of the past three years. Forecast sales for 1962, based on a current backlog of orders valued at £300,000, are expected to be 15 times greater than those of 1959.

British Seats for Canada

Canadair, Ltd., are to manufacture the range of Microcell aircraft passenger seats and have World selling rights outside the United Kingdom.

An agreement signed by the two companies has also provided for Microcell to supply to the Canadian company design details of a new seat stressed for 16*g*, both forward and aft facing. Canadair have, in fact, begun production of this seat which has been selected for the R.C.A.F.'s CL-44 Yukons and also the CL-28 Argus. Microcell also plans to produce this new seat.

Belfast Equipment Order

The 10 Short Belfast transports on order for the R.A.F. are to have combined Ultra and Trix public address system equipment. Value of the contract is about £12,000. First deliveries will be made early-1962. Trix Electronics, Ltd., is an Ultra subsidiary.

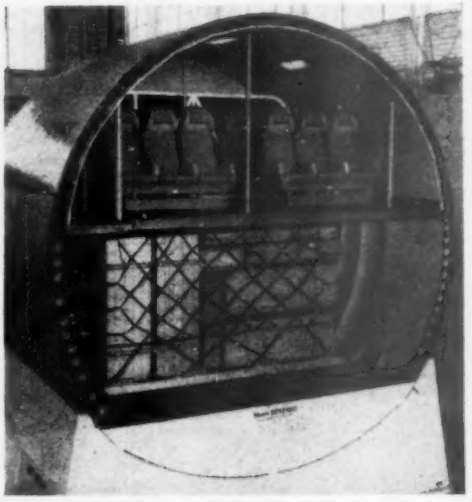
G.E.C. Divides

In accordance with the new policy of the General Electric Co., Ltd., to form its manufacturing groups into subsidiary companies, G.E.C. (Engineering), Ltd., has been formed to take over and develop engineering activities.

Manufacturing resources of this new company comprise the electrical engineering works at Witton, Birmingham, and the mechanical engineering works at Erith, Kent.

Members of the board, who will operate from a London headquarters, are: Mr. R. N. Millar (chairman and managing director); Mr. T. H. Kelsey (director and general manager, Witton); Dr. K. J. Wootton (director and general manager, Erith); Mr. C. J. O. Garrard (commercial director); Mr. E. Nicholson (financial director); Dr. H. K. Cameron (development director); Mr. G. M. F. Donnelly (production director); Mr. W. D. Morton (personnel director and assistant general manager, Witton); and Mr. J. E. Thomas (secretary).

An order recently received by G.E.C. (Engineering), valued at more than £10,000, is for a sealed water-quench furnace for installation at the Burnley works of Lucas Gas Turbine Equipment, Ltd. It will be used for the annealing and hardening of various types of high-grade steel and steel alloys.



The civil Belfast fuselage section shown by Short Brothers and Harland at Farnborough has been erected at Queen's Island as a permanent display for prospective customers and visitors.

Exhibition News

Two exhibitions, the Engineering Materials and Design Exhibition and the International Factory Equipment Exhibition, are to open in London next Monday. Both are at Earls Court and will run until Nov. 18.

A five-day conference at which 22 lectures are to be read is to be held in parallel with the exhibition concerned with engineering materials and design. The many new interesting developments that have come out of recent research are to be spotlighted by the lectures which will also cover aspects of design in a varied range of materials and applications.

Sir Sydney Camm, managing director and chief engineer of Hawker Aircraft, is to be chairman of one of the daily sessions.

Equipment and machinery produced by more than 350 firms will be on show at the International Factory Equipment Exhibition, the ninth to be held. Current developments in production, construction and maintenance will be found in the 375,000 sq. ft. of exhibition space.

Looking well into the future it has been announced that the next Engineering, Marine, Welding and Nuclear Energy Exhibition is to be much enlarged and take on an international flavour and a change of name. Scheduled to run from April 23 to May 2, 1963, it will be known as the London International Engineering Exhibition and occupy both Olympia and Earls Court making use of 1,000,000 sq. ft. of display space.

Attitude Control of the P.1127

At a time when the Hawker P.1127 has completed its first year of flight trials—the maiden flight was on Oct. 5, 1960—Fairey Engineering have been able to reveal the functions performed by the advanced hydraulic power-control unit which this aircraft utilizes. To date more than 100 vertical take-offs and landings and a number of complete transitions have been made by the P.1127, including many without autostabilization.

According to Fairey the three units providing power for the ailerons and tailplane are able to meet the demands of an automatic stabilizing computing system. This means that any tendency to yaw, pitch or roll is sensed by rate gyroscopes and is automatically signalled through the electro-hydraulic control systems to the hydraulic jacks, although the signals will always yield to a manual input command from the pilot.

Each unit can accept the usual direct input commands from the pilot and is fully duplicated hydraulically. Many of the P.1127's transitions, together with much of the normal flying, have been made with the pilot using direct manual control as on a conventional jet fighter and without the aid of any "black boxes" whatever.

The three units can, if required, accept signals from the autopilot with the pilot flying "hands off." He can preset course and altitude and the "black boxes" will feed signals through the autopilot and into an electro-hydraulic servo valve. This is really the key to the whole system, for it is this valve which then translates the signals into the hydraulic movements which control the aeroplane.

Aviation Calendar

Nov. 9

London.—Radar and Electronics Association lecture, "Space Communications—Orbits and Economics," by W. F. Hilton, at the R.S.A., John Adam Street, W.1, at 19.00 hrs.

Nov. 10

London.—British Interplanetary Society lecture, "Photography from Rockets and Satellites," by R. Hall, at the R.Ae.S., 4 Hamilton Place, W.1, at 18.30 hrs.

Nov. 14

London.—R.Ae.S. Astronautics and Guided Flight Section lecture. "A Comparison of the Control Problems of Missiles and Manned Aircraft," by K. W. Smith, at 4 Hamilton Place, W.1, at 18.00 hrs.

Luton Airport.—R.Ae.S. Branch Lecture. "Modern Ship Design," by J. Burton Davis, in the Napier Senior Staff Canteen, at 18.00 hrs.

Nov. 15

London.—Kronfeld Club Annual Exhibition of Aviation Paintings and Drawings in the Basement, 74 Eccleston Square, S.W.1; until Nov. 25.

Prestwick Airport.—R.Ae.S. Glasgow Branch Graduates' and Students' Section lecture, "Developments Intended for Prestwick Airport," by C. D. Waldron, at 19.30 hrs.

Nov. 16

London.—R.Ae.S. Seventeenth British Commonwealth lecture. "The Progress of B.E.A. and of European Air Transport 1946-61," by Lord Douglas of Kirtleside, at 4 Hamilton Place, W.1, at 18.00 hrs.

Nov. 17

London.—Institute of Navigation lecture. "The Navigation and Guidance of Supersonic Aircraft," by Capt. W. L. Polhemus, at the Royal Institution of Naval Architects, 10 Upper Belgrave Street, S.W.1, at 17.30 hrs.

London.—R.Ae.S. Man Powered Aircraft Group lecture, "Aerodynamics of Man Powered Aircraft," by T. R. F. Nonweiler, at 4 Hamilton Place, W.1, at 18.00 hrs.

Company Notices

NEW COMPANY

Freelance Crews, Ltd. (705,797).—Private co. Reg. Oct. 17. Cap. £100 in £1 shs. To establish and carry on lines of aerial communications. Directors: Francis A. Brown (airline pilot) and Mrs. Margaret C. Brown, both of Church Lodge, Hawley, Camberley, Surrey. Sec.: Margaret C. Brown. Reg. off.: Church Lodge, Hawley, Camberley, Surrey.

New Patents

APPLICATIONS ACCEPTED

884,430.—**Sperry Rand Corporation.** — "Aircraft navigation-aid apparatus." Mar. 21, 1958. (Mar. 28, 1957.)

884,552.—**Rolls-Royce, Ltd.** — "Propeller-driving powerplant." Aug. 6, 1958. (Aug. 13, 1957.)

884,303.—**A. J. Faillie.**—"Aircraft." April 8, 1958. (April 8, 1957, and Jan. 4, 1958.)

Printed specifications of the above will be available on Dec. 13, 1961, and the opposition period will expire on Mar. 13, 1962.

Personal Notices

BIRTHS

Barrett.—On Oct. 24, at R.A.F. Hospital, Changi, Singapore, to Margaret (*née* Robinson), wife of Sqn. Ldr. H. Barrett—a daughter.

Duncan.—On Oct. 24, at Gibraltar, to Anne, wife of Wg. Cdr. J. G. Duncan—a son.

Griffiths.—On Oct. 24, to Shirley (*née* Raymond), wife of Wg. Cdr. D. J. Griffiths—a daughter.

Jarvis.—On Oct. 24, at St. Giles Hospital, to Patricia, wife of Flt. Lt. P. D. Jarvis—a daughter.

DEATH

Stewart.—On Oct. 22, Sqn. Ldr. F. S. Stewart, R.A.F. (retd.).

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FOR sale. G44 SUPER WIDGEON, six place amphibian, long-range tanks, V.H.F. (dual omni), A.D.F. and L.F. radios, extensive reconditioning just completed. Box A114, care of THE AEROPLANE AND ASTRONAUTICS. 612-10

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ANY demonstration. Further details: Dr. J. F. McClory, 60 Silver Lonnen, Newcastle upon Tyne. Phone 39011. 613-x8444

FOR sale. PBY5A, converted to 285 ACF Cat, seating 10 passengers and three crew, wide cargo doors, dash 94 mod. P. and W. engines, large list of spares. Box A113, care of THE AEROPLANE AND ASTRONAUTICS. 612-9

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NOTICES

AIR TRANSPORT LICENSING BOARD.

THE Civil Aviation (Licensing) Regulations, 1960, require the Board to publish an official record entitled "Civil Aviation Licensing Notices," containing particulars of certain applications received, or proposals made by the Board in connection with air service licences, hearings arranged (including arrangements for hearings in connection with the advisory functions of the Board under Section 4 of the Civil Aviation (Licensing) Act, 1960), decisions made, hearings of appeals arranged by the Minister of Aviation and the Minister's orders on appeals.

PERSONS who wish to receive copies of this official record and whose names are not already on the circulation list should make application in writing to the Secretary, Air Transport Licensing Board, Therese House, 29-30 Glasshouse Yard, Aldersgate St., E.C.1.

APPLICANTS should state the number of copies they require of each issue and are requested to keep the number to a minimum. 612-2

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QUALIFICATIONS should include broad administrative and flying experience, organizing ability, good general knowledge of principles and functioning of air traffic control, telecommunications and ground aids to navigation, flight information and meteorological services, wide knowledge of aviation organization and ability to apply it to the needs of a busy civil airport.

THE administrative responsibilities are major in character, as the Harbours and Airport Committee of the States of Jersey is itself an aviation authority.

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DETAILS of conditions of service and application forms may be obtained from the Establishment Officer, States' Greffe, Jersey, C.I. Completed forms must be returned not later than December 4, 1961. 612-681

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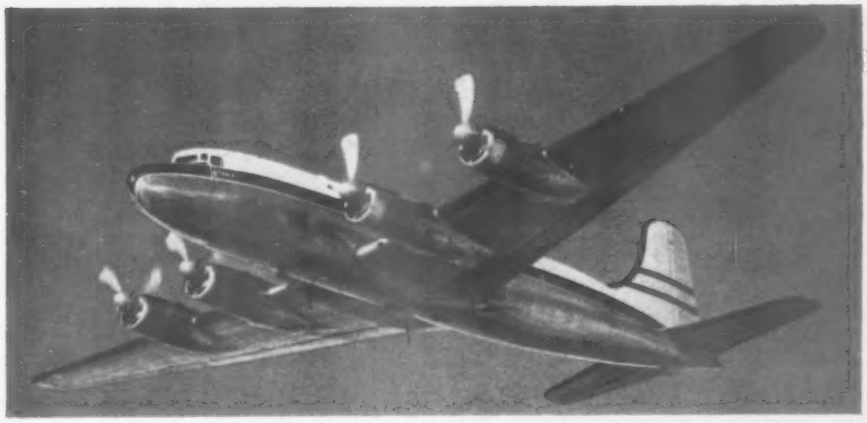

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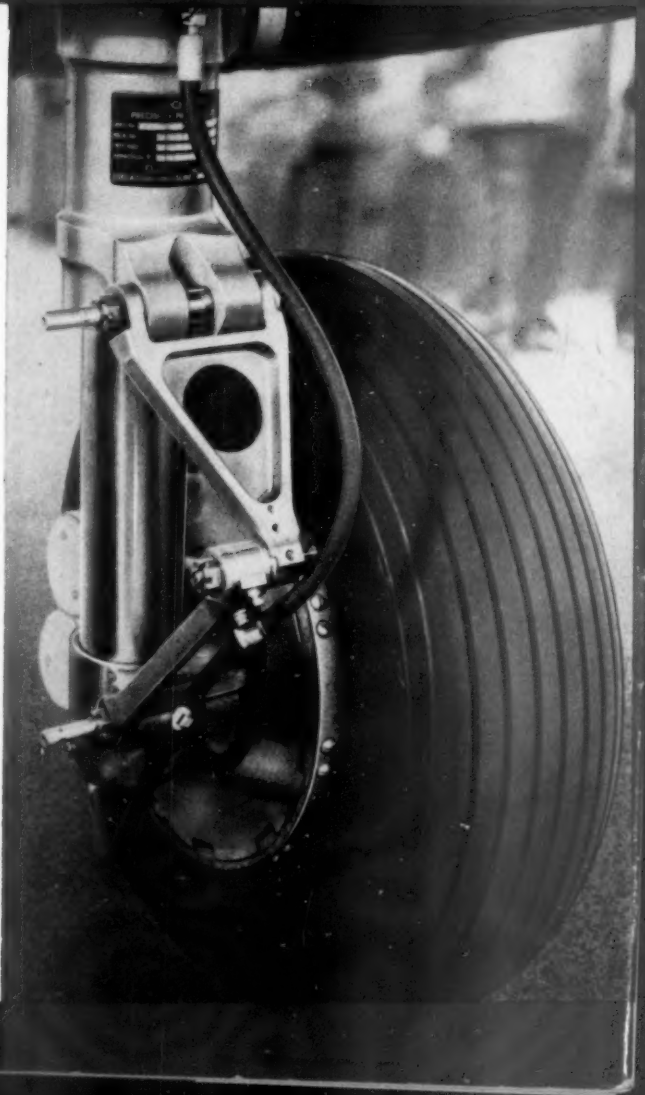

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